Department of Veterans Affairs

Louis Stokes Cleveland VA Medical Center
Wade Park
10701 East Boulevard
Cleveland, Ohio 44106

TECHNICAL SPECIFICATIONS

Project Number 541-15-206
Re-Roof 3rd Floor Day Hospital Roof

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DEPARTMENT OF VETERANS AFFAIRS

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SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 GENERAL INTENTION

A. Contractor shall completely prepare site for building operations, including temporary access facilities, and furnish labor and materials and perform work for the VAMC Louis Stokes Cleveland Re-Roof 3rd Fl. Day Hospital Roof as required by drawings and specifications.

B. Visits to the site by Bidders shall be in accordance with FAR 52.236-27 Site Visits.

C. Offices of Makovich & Pusti Architects, Inc., as Architect-Engineers, will render certain technical services during construction. Such services shall be considered as advisory to the Government and shall not be construed as expressing or implying a contractual act of the Government without affirmations by Contracting Officer or his duly authorized representative.

D. Before placement and installation of work subject to tests by testing laboratory retained by the Contractor, the Contractor shall notify the Contracting Officer's Representative (COR) in sufficient time to enable testing laboratory personnel to be present at the site in time for proper taking and testing of specimens and field inspection. Such prior notice shall be not less than three work days unless otherwise designated by the COR.

E. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.

F. Prior to commencing work, general contractor shall provide proof that a OSHA certified “competent person” (CP) (29 CFR 1926.20(b)(2) will maintain a presence at the work site whenever the general or subcontractors are present.

1. The Contractor shall designate a full time Superintendant dedicated to the project and be onsite for the duration of the project. A single Superintendant will not be permitted to manage multiple VA projects at one time.

G. Training:

1. All employees of General Contractor or Subcontractors shall have the following hours of OSHA certified Construction Safety course and /or other relevant competency training, as determined by VA CP with input from the ICRA team.

   a. Superintendent: 30 hours.

   b. All other workers: 10 hours.

2. Submit training records of all such employees for approval before the start of work.

1.2 STATEMENT OF BID ITEM(S)

A. ITEM 1, Re-Roof 3rd Fl. Day Hospital Roof includes the following:

1. Project includes reroof of existing roof area utilizing a single ply protected roof membrane assembly on a third floor roof area (2200sf) in and around mechanical equipment, (5900sf) open roof area, and (480sf) low roof area along curved bow window along the south elevation. Access for staging and booming material to roof and locating dumpster will be made available below from the south parapet. Staging area will be limited.

2. Project also includes replacement of roof to wall flashing and through wall flashing. Modification of existing storm drains is required to fully integrate with roofing system. Provide windows on east wall.

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

A. AFTER AWARD OF CONTRACT, 0 sets of specifications and drawings will be furnished.

1.4 CONSTRUCTION SECURITY REQUIREMENETS

A. Security Plan:

1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.

2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.

B. Security Procedures:

1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.

2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give 3 days notice to the Contracting Officer so that security escort arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.

3. No photography of VA premises is allowed without written permission of the Contracting Officer.

4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

C. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the COR for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.

2. All construction doors/access doors must use VA key system, and remain locked at all times from the corridor/exterior side.

D. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies.

2. No parking is available at Medical Center for contractors and Contractor commuter vehicles shall be parked off-site.

1.5 FIRE SAFETY

A. Applicable Publications: Publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

1. American Society for Testing and Materials (ASTM):

   E84-2008.....Surface Burning Characteristics of Building Materials

2. National Fire Protection Association (NFPA):

   10-2006.....Standard for Portable Fire Extinguishers

   30-2007.....Flammable and Combustible Liquids Code

   51B-2003.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work

   70-2007.....National Electrical Code

   241-2004.....Standard for Safeguarding Construction, Alteration, and Demolition Operations

3. Occupational Safety and Health Administration (OSHA):

   29 CFR 1926.....Safety and Health Regulations for Construction

B. Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to COR and Facility Safety Manager for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the general contractor’s competent person per OSHA requirements. This briefing shall include information on the construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, etc. Documentation shall be provided to the COR that individuals have undergone contractor’s safety briefing.

   1. A Hazardous Work Activity Checklist must be completed by the Contractor. Any activity with a YES response is to be detailed in the Site Specific Safety Plan. A sample Hazardous Work Activity Checklist is included at the end of this specification.

C. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.

D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).

E. Temporary Construction Partitions:

1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas, the areas that are described in phasing requirements and adjoining areas. Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Tape and finish joints and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices and VA locking system (storeroom type lock always locked from the corridor side). Paint gypsum board.

2. Install temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.

3. All work shall be performed after normal working hours, unless otherwise approved by the Contracting Officer.

F. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.

G. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with COR.

H. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to COR. Any construction materials found in exit stairs or corridors will be disposed of at Contractor’s expense.

I. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.

J. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

K. Sprinklers: Install, test and activate new automatic sprinklers prior to removing existing sprinklers.

L. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with COR. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the COR.

M. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with COR.

N. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COR. Obtain permits from facility COR at least 48 hours in advance. Provide adequate ventilation for areas where welding is performed.

O. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to COR.

P. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.

Q. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily. (Refer to Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT for GEMS POLICY REQUIREMENTS.

R. Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.

S. If required, submit documentation to the COR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

T. See additional OSHA Requirements and Safety and Health Regulations attachment at the end of this specification section.

1.6 OPERATIONS AND STORAGE AREAS

A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

D. Working space and space available for storing materials shall be as shown on the drawings as determined by the COR.

E. Workmen are subject to rules of Medical Center applicable to their conduct.

F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by COR where required by limited working space.

1. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than two work

days. Provide unobstructed access to Medical Center areas required to remain in operation.

2. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements and review and approval by COR.

3. Disruptive work to the VAMC, such as excessive noise, vibration, etc. is prohibited during normal working hours. The Contracting Officer has sole discretion to stop work and require that it be performed after normal business hours, with no additional cost to the Government. Additionally, such work performed adjacent to occupied patient rooms is prohibited.

4. The Contractor shall thoroughly investigate the impact of shutdowns on patient and staff prior to proceeding with shutdown.

G. Phasing: To insure such executions, Contractor shall furnish the COR with a schedule of approximate phasing dates on which the Contractor intends to accomplish work in each specific area of site, building or portion thereof. In addition, Contractor shall notify the COR two weeks in advance of the proposed date of starting work in each specific area of site, building or portion thereof. Arrange such dates to insure accomplishment of this work in successive sequences mutually agreeable to COR. Final inspection of each phase before moving on to the next will be required through the Contracting Officer and COR.

H. When a building is turned over to Contractor, Contractor shall accept entire responsibility therefore.

1. Contractor shall maintain a minimum temperature of 4 degrees C (40 degrees F) at all times, except as otherwise specified.

2. Contractor shall maintain in operating condition existing fire protection and alarm equipment. In connection with fire alarm equipment, Contractor shall make arrangements for pre-inspection of site with Fire Department or Company (Department of Veterans Affairs or municipal) whichever will be required to respond to an alarm from Contractor's employee or watchman.

I. Utilities Services: Maintain existing utility services for Medical Center at all times. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services. Where

necessary to cut existing water, steam, gases, sewer or air pipes, or conduits, wires, cables, etc. of utility services or of fire protection systems and communications systems (including telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by COR.

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of COR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the Medical Center Director’s prior knowledge and written approval.

2. Contractor shall submit a request to interrupt any such services to COR, in writing, (3) days for minor shutdowns and (2) weeks for major shutdowns in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.

3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by Medical Center may occur at other than Contractor's normal working hours. Shutdowns can be mandated at the discretion of the Contracting Officer to take place after normal business hours, including Saturdays and Sundays, with no additional cost to the Government.

4. Major interruptions of any system must be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the COR.

5. In case of a contract construction emergency, service will be interrupted on approval of COR. Such approval will be confirmed in writing as soon as practical.

6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.

7. All utility service shutdowns such as water, gas, steam, sewers, electricity or fire protection shall occur during off hours or weekends at not additional cost to the government.

J. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which are to be abandoned but are not required to be entirely removed, shall be sealed, capped or plugged. The lines shall not be capped in finished areas, but shall be removed and sealed, capped or plugged in ceilings, within furred spaces, in unfinished areas, or within walls or partitions; so that they are completely behind the finished surfaces.

K. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:

1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles.

L. Coordinate the work for this contract with other construction operations as directed by COR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

1.7 ALTERATIONS

A. Survey: Before any work is started, the Contractor shall make a thorough survey with the COR, of areas of buildings in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by all three, to the Contracting Officer. This report shall list by rooms and spaces:

1. Existing condition and types of resilient flooring, doors, windows, walls and other surfaces not required to be altered throughout affected areas of building.

2. Existence and conditions of items such as plumbing fixtures and accessories, electrical fixtures, equipment, venetian blinds, shades, etc., required by drawings to be either reused or relocated, or both.

3. Shall note any discrepancies between drawings and existing conditions at site.

4. Shall designate areas for working space, materials storage and routes of access to areas within buildings where alterations occur and which have been agreed upon by Contractor and COR.

B. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of COR, to be in such condition that their use is impossible or impractical, shall be furnished and/or replaced by Contractor with new items in accordance with specifications which will be furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).

C. Re-Survey: Thirty days before expected partial or final inspection date, the COR together shall make a thorough re-survey of the areas of buildings involved. They shall furnish a report on conditions then existing, of resilient flooring, doors, windows, walls and other surfaces as compared with conditions of same as noted in first condition survey report:

1. Re-survey report shall also list any damage caused by Contractor to such flooring and other surfaces, despite protection measures; and, will form basis for determining extent of repair work required of Contractor to restore damage caused by Contractor's workmen in executing work of this contract.

D. Protection: Provide the following protective measures:

1. Wherever existing roof surfaces are disturbed they shall be protected against water infiltration. In case of leaks, they shall be repaired immediately upon discovery.

2. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.

3. Protection of interior of existing structures at all times, from damage, dust and weather inclemency. Wherever work is performed, floor surfaces that are to remain in place shall be adequately protected prior to starting work, and this protection shall be maintained intact until all work in the area is completed.

1.8 INFECTION PREVENTION MEASURES

A. Infection Control permits (see sample at the end of this specification section) will be issued by the COTR. The Infection Control Permits will be posted outside the appropriate construction area. More than one permit may be issued for a construction project if the work is located in separate areas requiring separate classes. The primary project scope area for this project is: **Class III**, however, work outside the primary project scope area may vary. The required infection control precautions are denoted on the following table:

IV

Description of Required Infection Control Precautions *by Class*

	During Construction Project	Upon Completion of Project
CLASS I	1. Notify and receive permission from the COTR to perform requested work. 2. Execute work by methods to minimize raising dust from construction operations. 3. Immediately replace a ceiling tile displaced for visual inspection.	1. Notify COTR for inspection once the work is complete.
CLASS II	1. Notify and receive permission from the COTR to perform requested work. 2. Provide active means to prevent airborne dust from dispersing into atmosphere. 3. Water mist work surfaces to control dust while cutting. 4. Seal unused doors with duct tape. 5. Block off and seal air vents. 6. Place dust mat at entrance and exit of work area. 7. Remove or isolate HVAC system in areas where work is being performed.	1. Wipe work surfaces with disinfectant. 2. Contain construction waste before transport in tightly covered containers. 3. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 4. Remove isolation of HVAC system in areas where work is being performed.
CLASS III	1. Obtain and post valid Infection Control Construction Permit at each work site. Permit must be signed by COTR, I.C. Nurse and General Contractor to be valid. 2. Remove or isolate HVAC system in area where work is being done to prevent contamination of duct system. 3. Complete all critical barriers, i.e., sheetrock, plywood, plastic, to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Construction of barrier will need to occur outside normal work shifts with approval of COTR. 4. Construct anteroom where possible and directed by COTR. 5. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 6. Contain construction waste before transport in tightly covered containers. 7. Cover transport receptacles or carts. Tape covering unless solid lid. 8. If the spread of dust from construction personnel is not contained workers may be required to where show covers and or be vacuumed prior to leaving worksite at the discretion of the COTR or I.C. Nurse. 9. Seal holes, pipes, conduits and punctures appropriately. 10. Include particle count readings on daily logs against baseline points as required by COTR or I.C. Nurse.	1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department. 2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. Barriers are required to be removed after hours with approval of COTR. 3. Vacuum work area with HEPA filtered vacuums. 4. Wet mop area with disinfectant. 5. Remove isolation of HVAC system in areas where work is being performed.

CLASS IV	1. Follow all requirements listed in Class III as well as additional requirements listed below. 2. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site, or they can wear cloth or paper coveralls that are removed each time they leave the work site. 3. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.	1. Before work is turned over and accepted by the VA a certified I.H. must be used to certify cleaning as well as swab and air sampling of the area. These tests shall meet or exceed industry standards for the type of area being renovated.

B. An infection control orientation will be provided by the VA Infection Control Personnel to the Contractor prior to construction start.

C. Implement the requirements of VAMC's Infection Control Risk Assessment (ICRA) team. ICRA Group may monitor dust in the vicinity of the construction work and require the Contractor to take corrective action immediately if the safe levels are exceeded.

D. Establish and maintain a dust control program as part of the contractor's infection preventive measures in accordance with the guidelines provided by ICRA Group as specified here. Prior to start of work, prepare a plan detailing project-specific dust protection measures, including periodic status reports, and submit to COR for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PROJECT DATA, and SAMPLES.

1. All personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.

E. Medical center Infection Control personnel shall monitor for airborne disease (e.g. aspergillosis) as appropriate during construction. A baseline of conditions may be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality. In addition:

1. The COR and VAMC Infection Control personnel shall review pressure differential monitoring documentation to verify that pressure

differentials in the construction zone and in the patient-care rooms are appropriate for their settings. The requirement for negative air pressure in the construction zone shall be maintained at all times. Upon notification, the contractor shall implement corrective measures to restore proper pressure differentials as needed.

2. In case of any problem, the medical center, along with assistance from the contractor, shall conduct an environmental assessment to find and eliminate the source.

F. In general, following preventive measures shall be adopted during construction to keep down dust and prevent mold.

1. Dampen debris to keep down dust and provide temporary construction partitions in existing structures where directed by COR. Blank off ducts and diffusers to prevent circulation of dust into occupied areas during construction.

2. Do not perform dust producing tasks within occupied areas without the approval of the COR. For construction in any areas that will remain jointly occupied by the Medical Center and Contractor’s workers, the Contractor shall:

a. Provide dust proof temporary drywall construction barriers to completely separate construction from the operational areas of the hospital in order to contain dirt debris and dust. Barriers shall be sealed and made presentable on hospital occupied side. Install a self-closing rated door in a metal frame, commensurate with the partition, to allow worker access. Maintain negative air at all times. Barrier installation to be done outside normal Medical Center hours.

b. HEPA filtration is required where the exhaust dust may reenter the breathing zone. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. Install HEPA (High Efficiency Particulate Accumulator) filter vacuum system rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. Insure continuous negative air pressures occurring within the work area. HEPA filters should have ASHRAE 85 or other prefilter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Exhaust hoses shall be heavy duty,

flexible steel reinforced and exhausted so that dust is not reintroduced to the Medical Center.

c. Adhesive Walk-off/Carpet Walk-off Mats, minimum 600mm x 900mm (24" x 36"), shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.

d. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as they are created. Transport these outside the construction area in containers with tightly fitting lids at the end of each shift.

e. The Contractor shall not haul debris through patient-care areas without prior approval of the COR and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc. transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.

f. Using a HEPA vacuum, clean inside the barrier and vacuum ceiling tile prior to replacement. Any ceiling access panels opened for investigation beyond sealed areas shall be sealed immediately when unattended.

g. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.

h. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.

G. Final Cleanup:

1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.

2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.

3. All new air ducts shall be cleaned prior to final inspection with reports submitted to COR.

1.9 DISPOSAL AND RETENTION

A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:

1. Reserved items which are to remain property of the Government are identified by attached tags or noted on drawings or in specifications as items to be stored. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by COR.

2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.

3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the Department of Veterans Affairs during the alteration period, such items which are NOT required by drawings and specifications to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with Contractor's operation.

1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless

operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

(FAR 52.236-9)

C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

D. Refer to FAR clause 52.236-7, "Permits and Responsibilities," which is included in General Conditions. A National Pollutant Discharge Elimination System (NPDES) permit is required for this project. The Contractor is considered an "operator" under the permit and has extensive responsibility for compliance with permit requirements. VA will make the permit application available at the (appropriate medical center) office. The apparent low bidder, contractor and affected subcontractors shall furnish all information and certifications that are required to comply with the permit process and permit requirements. Many of the permit requirements will be satisfied by completing construction as shown and specified. Some requirements involve the Contractor's method of operations and operations planning and the Contractor is responsible for employing best management practices. The affected activities often include, but are not limited to the following:

- Designating areas for equipment maintenance and repair;

- Providing waste receptacles at convenient locations and provide regular collection of wastes;

- Locating equipment wash down areas on site, and provide appropriate control of wash-waters;

- Providing protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials; and

- Providing adequately maintained sanitary facilities.

1.11 RESTORATION

A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the COR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the COR before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.

B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.

C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.

D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

1.12 AS-BUILT DRAWINGS

A. The Contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.

B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the COR's review, as often as requested.

C. Contractor shall deliver two approved completed sets of as-built drawings to the COR within 15 calendar days after each completed phase and after the acceptance of the project by the COR.

D. Paragraphs A, B, & C shall also apply to all shop drawings.

1.13 USE OF ROADWAYS

A. For hauling, use only established public roads and roads on Medical Center property. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges.

1.14 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT

A. Use of new installed mechanical and electrical equipment to provide heat, ventilation, plumbing, light and power will be permitted subject to compliance with the following provisions:

1. Permission to use each unit or system must be given by COR. If the equipment is not installed and maintained in accordance with the following provisions, the COR will withdraw permission for use of the equipment.

2. Electrical installations used by the equipment shall be completed in accordance with the drawings and specifications to prevent damage to the equipment and the electrical systems, i.e. transformers, relays, circuit breakers, fuses, conductors, motor controllers and their overload elements shall be properly sized, coordinated and adjusted. Voltage supplied to each item of equipment shall be verified to be correct and it shall be determined that motors are not overloaded. The electrical equipment shall be thoroughly cleaned before using it and again immediately before final inspection including vacuum cleaning and wiping clean interior and exterior surfaces.

3. Units shall be properly lubricated, balanced, and aligned. Vibrations must be eliminated.

4. Automatic temperature control systems for preheat coils shall function properly and all safety controls shall function to prevent coil freeze-up damage.

5. The air filtering system utilized shall be that which is designed for the system when complete, and all filter elements shall be replaced at completion of construction and prior to testing and balancing of system.

6. All components of heat production and distribution system, metering equipment, condensate returns, and other auxiliary facilities used in temporary service shall be cleaned prior to use; maintained to prevent corrosion internally and externally during use; and cleaned, maintained and inspected prior to acceptance by the Government.

B. Prior to final inspection, the equipment or parts used which show wear and tear beyond normal, shall be replaced with identical replacements, at no additional cost to the Government.

C. This paragraph shall not reduce the requirements of the mechanical and electrical specifications sections.

1.15 TEMPORARY USE OF EXISTING ELEVATORS

A. Use of existing elevators for handling building materials for interior use only and Contractor’s interior construction personnel will only be permitted subject to following provisions:

1. Contractor makes all arrangements with the COR for use of elevators. The COR will ascertain that elevators are in proper condition. Contractor may use elevators for daily use for personnel only between the hours of 7:00 a.m. and 6:00 p.m. and for special non-recurring time intervals when permission is granted. Personnel for operating elevators will not be provided by the Department of Veterans Affairs.

2. Contractor to develop a proposed elevator usage plan for review and approval by COR.

3. Contractor covers and provides maximum protection of following elevator components:

a. Entrance jambs, heads soffits and threshold plates.

b. Entrance columns, canopy, return panels and inside surfaces of car enclosure walls.

c. Finish flooring.

4. If brake lining of elevators are excessively worn or damaged during temporary use, they shall be removed and replaced by new brake lining.

5. All parts of main controller, starter, relay panel, selector, etc., worn or damaged during temporary use shall be removed and replaced with new parts, if recommended by the elevator inspector after elevator is released by Contractor.

6. Place elevator in condition equal, less normal wear, to that existing at time it was placed in service of Contractor as approved by Contracting Officer.

1.16 TEMPORARY TOILETS

A. Provide where directed by COR, ample temporary sanitary toilet accommodations with suitable sewer and water connections; or, when approved by COR, provide suitable dry closets where directed. Keep such places clean and free from flies, and all connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean.

1.17 AVAILABILITY AND USE OF UTILITY SERVICES

A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.

B. Heat: Furnish temporary heat necessary to prevent injury to work and materials through dampness and cold. Use of open salamanders or any temporary heating devices which may be fire hazards or may smoke and damage finished work, will not be permitted. Maintain minimum temperatures as specified for various materials:

1. Obtain heat by connecting to Medical Center heating distribution system.

   a. Steam is available at no cost to Contractor.

C. Electricity (for Construction):

1. Obtain electricity by connecting to the Medical Center electrical distribution system.

D. Water (for Construction):

1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection. Water is available at no cost to the Contractor.

2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at COR's discretion) of use of water from Medical Center's system.

1.18 NEW TELEPHONE EQUIPMENT (NOT USED)

1.19 TESTS

A. Pre-test mechanical and electrical equipment and systems and make corrections required for proper operation of such systems before requesting final tests. Final test will not be conducted unless pre-tested.

B. Conduct final tests required in various sections of specifications in presence of an authorized representative of the Contracting Officer. Contractor shall furnish all labor, materials, equipment, instruments, and forms, to conduct and record such tests.

C. Mechanical and electrical systems shall be balanced, controlled and coordinated. A system is defined as the entire complex which must be coordinated to work together during normal operation to produce results for which the system is designed. For example, air conditioning supply air is only one part of entire system which provides comfort conditions for a building. Other related components are return air, exhaust air, steam, chilled water, refrigerant, hot water, controls and electricity, etc. Another example of a complex which involves several components of different disciplines is a boiler installation. Efficient and acceptable boiler operation depends upon the coordination and proper operation of fuel, combustion air, controls, steam, feedwater, condensate and other related components.

D. All related components as defined above shall be functioning when any system component is tested. Tests shall be completed within a reasonably short period of time during which operating and environmental conditions remain reasonably constant.

E. Individual test result of any component, where required, will only be accepted when submitted with the test results of related components and of the entire system.

1.20 INSTRUCTIONS

A. Contractor shall furnish Maintenance and Operating manuals and verbal instructions when required by the various sections of the specifications and as hereinafter specified.

B. Manuals: Maintenance and operating manuals (four copies each) for each separate piece of equipment shall be delivered to the COR coincidental with the delivery of the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment. They shall include complete information necessary for starting, adjusting, maintaining in continuous operation for long periods of time and dismantling and reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all component parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished will not be accepted.

C. Instructions: Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed instructions to assigned Department of Veterans Affairs personnel in the operation and complete maintenance for each piece of equipment. All such training will be at the job site. These requirements are more specifically detailed in the various technical sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a system shall be available until instructions for all items included in the system have been completed. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the COR and shall be considered concluded only when the COR is satisfied in regard to complete and thorough coverage. The Department of Veterans Affairs

reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the COR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

1.21 GOVERNMENT-FURNISHED PROPERTY (NOT USED)

1.22 RELOCATED EQUIPMENT AND ITEMS

A. Contractor shall disconnect, dismantle as necessary, remove and reinstall in new location, all existing equipment and items indicated to be relocated by the Contractor.

B. Perform relocation of such equipment or items at such times and in such a manner as directed by the COR.

C. Suitably cap existing service lines, such as steam, condensate return, water, drain, gas, air, vacuum and/or electrical, whenever such lines are disconnected from equipment to be relocated. Remove abandoned lines in finished areas and cap as specified herein before under paragraph "Abandoned Lines".

D. Provide all mechanical and electrical service connections, fittings, fastenings and any other materials necessary for assembly and installation of relocated equipment; and leave such equipment in proper operating condition.

E. All service lines such as noted above for relocated equipment shall be in place at point of relocation ready for use before any existing equipment is disconnected. Make relocated existing equipment ready for operation or use immediately after reinstallation.

- - - E N D - - -

OSHA Requirements and Safety and Health Regulations

PART 1 - OSHA Requirements

1.1 General

A. Contractors are required to comply with the Occupational Safety and Health Act of 1970. This will include the safety and health standard found in Code of Federal Regulations (CFR) 1910 and 1926. Copies of those standards can be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20420.

B. In addition, Contractor will be required to comply with other applicable Medical Center policies and safety regulations. These policies and regulations will be presented to the Contractor at the pre-construction meeting. Each of the Contractor's employees will be required to read the statement of policies and regulations, and sign an acknowledgment that such policies and regulations are understood. Signed acknowledgment will be returned to the Contract Officer Technical Representative (COTR).

C. Contractors involved with the removal, alteration or disturbance of asbestos-type insulation or materials or lead paint will be required to comply strictly with the regulations found in CFR 1910.1001 and the appropriate Environmental Protection Agency (EPA) lead regulations regarding disposal of asbestos or lead paint. Assistance in identifying asbestos or lead can be requested from the Medical Center's Industrial Hygienist and the COTR.

D. Contractors entering locations of asbestos contamination or lead paint residue (i.e., pipe, basements, walls, windows) shall be responsible for providing respiratory protection to their employees and ensuring respirators are worn in accordance with the Occupational Safety and Health Administration (OSHA) [CFR 1910.1001(g)]. Asbestos-or lead paint-contaminated areas shall be defined on project drawings. The minimum equipment requirements will be a half-mask air-purifying respirator equipped with high efficiency filters and disposable coveralls, or as determined by air monitoring results.

E. Contractor, along with other submittals and at least two weeks prior to bringing any materials on-site, must submit a complete list of chemicals the Contractor will use and Material Safety Data Sheets (MSDS) for all hazardous materials as defined in OSHA 1910.1200(d), Hazard Determination. Contracting Officer shall have final approval of all materials brought on site.

F. The Contractor will be held solely responsible for the safety and health of their employees. The contractor will also be held responsible for protecting the health and safety of the VA Community (patients, staff, and visitors) from the unwanted effects of construction. VA staff will monitor the Contractor's performance in complying with all safety and health aspects of the project. Severe or constant violations may result in an immediate work stoppage or request for a Compliance Officer from the Occupational Safety and Health Administration.

G. During all phases of demolition, construction and alterations, Contractors are required to understand and strictly follow National Fire Protection Association (NFPA) 241, Standard for Safeguarding Construction, Alteration and Demolition Operations. The Medical Center's Safety and Occupational Health Specialist or Industrial Hygienist will closely monitor the work area for compliance. Appropriate action will be taken for non-compliance.

PART 2 - Specific VA Medical Center Fire and Safety Policies, Procedures and Regulations

2.1 Introduction.

A. The safety and fire protection of patients, employees, members of the public and government is one of continuous concern to this Medical Center.

B. Contractors, their supervisors and employees are required to comply with Medical Center policies to ensure the occupational safety and health of all. Failure to comply may result in work stoppage.

C. While working at this Medical Center, contractors are responsible for the occupational safety and health of their employees. Contractors are required to comply with the applicable OSHA standards found in 29 CFR 1910 for general industry and 29 CFR 1926 for construction. Failure to comply with these standards may result in work stoppage and a request to the Area Director of OSHA for a Compliance Officer to inspect your work site.

D. Contractors are to comply with the requirements found in the National Fire Protection Association (NFPA) 241, Building Construction and Demolition Operation, and NFPA 51B, Fire Prevention in Use of Cutting and Welding Processes.

E. Questions regarding occupational safety and health issues can be addressed to the Medical Center Safety and Occupational Health Specialist (ext. 4172) or Industrial Hygienist (ext. 4628).

F. Smoking is not permitted in any interior areas of the Medical Center, including all interior stairwells, tunnels, construction and/or service/maintenance sites. Compliance with this policy by your direct and subcontracted labor force is required.

2.2 Hazard Communication

A. Contractors shall comply with OSHA Standard 29 CFR 1926.59, Hazard Communication.

B. Contractors shall submit to the COTR, copies of MSDS covering all hazardous materials to which the Contractor and VA employees are exposed.

C. Contractors shall inform the Safety Officer of the hazards to which VA personnel and patients may be exposed.

D. Contractors shall have a written Hazard Communication Program available at the construction site, which details how the Contractor will comply with 29 CFR 1926.59.

2.3 Fires

A. All fires must be reported. In the event of a fire in your work area, use the nearest pull box station, and also notify Medical Center staff in the immediate area. Emergency notification can also be accomplished by dialing ext. 2222.

B. Be sure to give the exact location from where you are calling and the nature of the emergency. If a Contractor experiences a fire that was rapidly extinguished by your staff, you still must notify the COTR within an hour of the event so that an investigation of the fire can be accomplished.

2.4 Fire Alarms, Smoke Detection and Sprinkler System

If the nature of your work requires the deactivation of the fire alarm, smoke detection or sprinkler system, you must notify the COTR. Notification must be made in accordance with the major and minor shutdown requirements of the specification so time can be allowed to deactivate the system and provide alternative measures for fire protection. Under no circumstance is a Contractor allowed to deactivate any of the fire protection systems in this Medical Center.

2.5 Smoke Detectors

False alarms will not be tolerated. You are required to be familiar with the location of the smoke detectors in your work area. When performing cutting, burning or welding or any other operations that may cause smoke or dust, you must take steps to temporarily cover

smoke detectors in order to prevent false alarms. Failure to take the appropriate action will result in the Contracting Officer assessing actual costs for government response for each false alarm that is preventable. Prior to covering the smoke detectors, the Contractor will notify the COTR, who will also be notified when the covers are removed.

2.6 Hot Work Permit

A. Hot work is defined as operations including, but not limited to, cutting, welding, thermal welding, brazing, soldering, grinding, thermal spraying, thawing pipes or any similar situation. If such work is required, whenever possible the Contractor must notify the COTR no less than three (3) days in advance of such work. The Competent Hot Work Supervisor (CHWS) will inspect the work area and issue a Hot Work Permit, authorizing the performance of such work.

B. All hot work will be performed in compliance with the Medical Center's policy 138-012 regarding Hot Work Permits and NFPA 241, Safeguarding Construction, Alternation and Demolition Operations; and NFPA 51B, Fire Prevention in Use of Cutting and Welding Processes; and applicable OSHA standard. A hot work permit will only be issued to individuals familiar with these regulations.

C. A Hot Work Permit will be issued only for the period necessary to perform such work. In the event the time necessary will exceed one day, a Hot Work Permit may be issued for the period needed; however, the CHWS will inspect the area daily. Hot Work Permit will apply only to the location identified on the permit. If additional areas involve hot work, then additional permits must be requested.

D. Contractors will not be allowed to perform hot work processes without the appropriate permit.

E. Any work involving the Medical Center's fire protection system will require advance notification. Under no circumstance will the Contractor or employee attempt to alter or tamper with the existing fire protection system.

F. Thirty minutes following completion of the hot work, the Fire Watch will perform an inspection of the area to confirm that sparks or drops of hot metal are not present.

2.7 Temporary Enclosures

Only non-combustible materials will be used to construct temporary enclosures or barriers at this Medical Center. Materials used to construct dust barriers must conform to NFPA 701, Standard Methods of Fire Tests for Flame-Resistant Textiles and Films.

2.8 Flammable Liquids

All flammable liquids will be kept in approved safety containers. Only the amount necessary for your immediate work will be allowed in the building. Flammable liquids must be removed from the building at the end of each day.

2.9 Compressed Gas Cylinders

Compressed gas shall be secured in an upright position at all times. A suitable cylinder cart will be used to transport compressed gas cylinders. Only those compressed gas cylinders necessary for immediate work will be allowed in occupied buildings. All other compressed gas cylinders will be stored outside of buildings in a designated area. Contractors will comply with applicable standards compressed gas cylinders found in 29 CFR 1910 and 1926 (OSHA).

2.10 Internal Combustion Engine-Powered Equipment

Equipment powered by an internal combustion engine (such as saws, compressors, generators, etc.) will not be used in an occupied building. Special consideration may be given for unoccupied buildings only if the OSHA and NFPA requirements have been met.

2.11 Powder-Activated Tools

The operator of powder-activated tools must be trained and certified to use them. Powder-activated tools will be kept secured at all times. When not in use, the tools will be locked up. When in use, the operator will have the tool under his immediate control.

2.12 Tools

A. Under no circumstances will equipment, tools and other items of work to be left unattended for any reason. All tools, equipment and items of work must be under the immediate control of your employee.

B. If for some reason a work area must be left unattended, then tools and other equipment must be placed in an appropriate box or container and locked. All tool boxes, containers or any other device used for the storage of tools and equipment will be provided with a latch and padlock, and will be kept locked at all times, except for putting in and removing tools.

C. All doors to work areas will be closed and locked when rooms are left unattended. Failure to comply with this policy will be considered a violation of VA Regulations 1.218(b), Failure to comply with signs of a directive and restrictive nature posted for safety purposes, and subject to a $50.00 fine. Subsequent similar violations may result in both imposition of such a fine as well as the Contracting Officer taking

action under the contract's Accident Prevention Clause [Federal Acquisition Regulation (FAR) 52.236-13] to suspend all contract work until violations may be satisfactorily resolved, or under FAR 52.236-5, Material and Workmanship Clause, to remove from the worksite any personnel deemed by the Contracting Officer to be careless to the point of jeopardizing the welfare of facility patients or staff.

D. You must report any tools or equipment that are missing to the VA Police Department.

E. Tools and equipment found unattended will be confiscated and removed from the work area.

2.13 Ladders

Ladders must not be left unattended in an upright position. Ladders must be attended at all times or taken down, and chained securely to a stationary object.

2.14 Scaffolds

All scaffolds will be attended at all times. When not in use, an effective barricade (fence) will be erected around the scaffold to prevent use by unauthorized personnel (Reference OSHA 1926, Subpart L).

2.15 Excavations

The contractor shall comply with OSHA 1926, Subpart P. An OSHA Competent Person must be on site during the excavation. The contractor shall coordinate with COTR and utility companies prior to the excavation to identify underground utilities tanks, etc. All excavations left unattended will be provided with a barricade suitable to prevent entry by unauthorized persons.

2.16 Storage

You must make prior arrangements with the COTR for the storage of building materials. Storage will not be allowed to accumulate in the Medical Center buildings.

2.17 Trash and Debris

You must remove all trash and debris from the work area on a daily basis. Trash and debris will not be allowed to accumulate inside or outside of the buildings. You are responsible for making arrangements for removal of trash from the Medical Center facility.

2.18 Protection of Floors

It may be necessary at times to take steps to protect floors from dirt, debris, paint, etc. A tarp or other protective covering may be used in accordance with specifications outlined in the general requirements section. However, you must maintain the proper amount of floor space for the safe passage of pedestrian traffic.

2.19 Signs

Signs must be placed at the entrance to work areas warning people of your work. Signs must be suitable for the condition of the work. Small pieces of paper with printing or writing are not acceptable. The VA Medical Center (VAMC) Safety Officer or COTR can be consulted in this matter.

2.20 Accidents and Injuries

Contractors must report all accidents and injuries involving their employees.

2.21 Infection Control

Contractors must control the generation of dust and the contamination of patient care surfaces, supplies and equipment. During demolition phases of the construction:

A. The construction area shall be under negative pressure, ensuring there is an appreciable flow of clean air from the VA-occupied portion of the facility into the construction area. The airflow shall be sufficiently strong enough to draw in the plastic door flaps commonly located at the construction entrance or at the specific site within the construction area.

B. Construction debris being transported through the VA-occupied portion of the facility shall be covered and/or whetted.

C. Construction employees shall remove dust-laden clothing before entering the VA-occupied portion of the facility.

D. Carpet/sticky mats shall be placed at all construction entrances, and be satisfactorily maintained so as to minimize the tracking of dust into the VA-occupied portion of the facility.

E. Dry sweeping of dust and debris is not to be performed.

F. Contractor must obtain an Infection Control Construction permit from the COTR before work can begin. A separate permit is required for each area work is being

done. Permit must be signed by the I.C. Nurse, COTR, and Contractor. Permit is required to be posted outside work site at all times.

(Control measures B - E above must be practiced during the construction phase.)

2.22 Confined Space Entry

A. Contractor will be notified if a project work area contains spaces requiring a confined space work permit. Entry to these confined space areas will only be permitted through compliance with a permit space program meeting the requirements of 29 CFR 1910.146 and 1926.21(b)(6).

B. Contractor will be apprised of the elements including the hazards identified and the Medical Center's (last employer) experience with the space that makes the space in question a permit space.

C. Contractor will be apprised of any precautions or procedures that the Medical Center has implemented for the protection of employees in or near permit space where Contractor personnel will be working.

D. Medical Center and Contractor will coordinate entry operations when both Medical Center personnel and Contractor personnel will be working in or near permit spaces as required by 29 CFR 1910.146(d)(ii) and 1926.21(b)(6).

E. Contractor will obtain any available information regarding permit space hazards and entry operation from the Medical Center.

F. At the conclusion of the entry operations, the Medical Center and Contractor will discuss any hazards confronted or created in permit spaces.

G. The Contractor is responsible for complying with 29 CFR 1910.246(d) through (g) and 1926.21(b)(6). The Medical Center, does not provide rescue and emergency services required by 29 CFR 1910.246(k) and 1926.21(b)(6).

2.23 Contractor Parking and Material Delivery

Contractor's parking is not available at the medical center and the delivery of building materials tools, etc., must be pre-arranged with the COTR.

SAMPLE INFECTION CONTROL PERMIT

Infection Control Construction Permit

Construction Class:

Project Name and Number:	**Permit #:**
Location of Construction:	
COTR:	**Telephone:**
Contractor Performing Work:	
Supervisor:	**Telephone:**

CLASS I	1. Obtain approval from COTR before activities begin 2. Work performed is limited to inspections and minor installations 3. Execute work by methods to minimize raising dust from inspection operations 4. Permit does not need to be posted for this classification.
CLASS II	1. Obtain and post infection control permit at work location before work begins 2. Provide active means to prevent air borne dust from dispersing into atmosphere 3. Place dust mat at entrances and exits of work sites 4. Tools and equipment must be cleaned prior to entrance to the medical center 5. Isolate HVAC and seal unused doors with duct tape 6. Contain construction waste before transport in tightly covered containers
CLASS III	1. Obtain and post infection control permit at work location before work begins 2. Follow all requirements listed for Class II in addition to requirements listed below 3. Isolate supply and return ductwork to prevent contamination of system. 4. Complete all critical dust barriers as well as the creation of an anti-room where required for inspection by COTR before work begins. 5. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 6. Construct antiroom where required by COTR and I.C. Nurse 7. Obtain COTR approval before contruction and removal of any dust partitions 8. Include paticle count readings on daily logs against baseline points as required by COTR or I.C. Nurse.
CLASS IV	1. Obtain and post infection control permit at work location before work begins 2. Follow all requirements listed for Class III in addition to requirements listed below 3. Workers are required to wear clean suites on site 4. All personel entering and leving work site must be vacuumed using a HEPA filted vacuum cleaner. 5. This class of permit will require additional specilized precautions unique to each activity which will be listed below

Additional Requirements:

Infection Control Nurse:	**Date:**
COTR:	**Date:**
Contractor:	**Date:**

Pre-Construction Risk Assessment

Project: _____ Project/Contract #: _____

This form may be used for projects or activities to determine if a Site Specific Safety Plan (SSSP) is necessary. If the contractor or vendor is not working independently (VAMC Supervisor is present and in control of the contractor) and the job is short duration (less than five working days) and the hazard analysis does not include any high risk activities, then Occupational Health and Safety may allow work without submitting a SSSP.

Activity	Yes	High Risk
1. Respiratory protection is required for the work being conducted List specifics: (activity being preformed, PPE Being used, Training, Fit testing).		
2. Hearing protection is required for the work being conducted List specifics: (Type of noise; impact, constant, start up).		
3. Other personal protective equipment is required for the work being conducted, what activity? _____ List specifics: (Gloves, safety Glasses, hard hat, steel toes, overalls).		
4. Are there overhead hazards associated with the activity being conducted? Wires, power, communication, grounding, location(s), signage. List specifics:		Yes
5. Work is being conducted in a confined space. Permit required? Training? List specifics: Tanks, sewer, tunnels, Rescue Team notification.		PRCS Only
6. Ladders will be necessary for the work being conducted.		
7. Scaffolding will be necessary for the work being conducted. List specifics:		Greater than six feet
8. Other work platforms will be necessary for the work being conducted. List specifics: Rails, toe boards, netting		Greater than six feet
9. Fall protection is required for the work being conducted. List specifics:		Yes

Pre-Construction Risk Assessment

10. ASBESTOS Abatement Exposure to asbestos may be associated with the work being conducted. List specifics: Renovation, Demolition, Emergency Response 29 CFR 1910.1001.		Yes unless approved by the Asbestos Manager
Activity	Yes	High Risk
11. Hazardous materials will be used. MSDSs will be provided for known substances List specifics: 29 CFR 1910.1200.		
12. Hot work (Cutting, Welding, Brazing, etc). Use of VAMC Cleveland Hot Work Policy (ECP 138-047) is required.		
13. Additional ventilation will be necessary for the work being conducted. List specifics: Reason for need of ventilation, confined space, foul odor, excessive heat.		
14. Operation and maintenance of electric power generation, control, transformation, transmission, and distribution lines and equipment are necessary for the work being conducted. List specifics:		Yes
15. Work will be conducted on energized equipment. Use of VAMC Cleveland Working on Energized Equipment policy (138-034) is required. List specifics: list voltages in area, emergency procedures.		Yes
16. Other electrical work will be conducted. List specifics:		
17. Lock Out/Tag Out will be necessary for the work being conducted. List specifics:		
18. Cranes, derricks, or slings will be necessary for the work being conducted. List specifics:		Yes
19. Excavating will be necessary for work being conducted. List site specifics:		Yes

Pre-Construction Risk Assessment

Activity	Yes	High Risk
20. Excavating or earthmoving equipment will be used. List specifics:		
21. Industrial trucks will be used. List specifics:		
22. Other motorized vehicles will be used. List specifics:		
23. Concrete and masonry construction operations will be necessary for work being conducted. List specifics: % of recycled components		
24. Steel erection activities will be necessary for the work being conducted. List specifics: New Steel % of recycled material,		Yes
25. Alteration, conversion, or improvement of existing electric transmission and distribution lines and equipment will be necessary for the work being conducted. List specifics:		Yes
26. Hand and portable powered tools or other hand-held equipment will be used.		
27. Compressed gas or compressed air equipment is necessary for work being conducted.		
28. List all other hazardous activities that will be conducted or potentially hazardous equipment that will be used including vibration hazards.		

Pre-Construction Risk Assessment

Activity	Yes	High Risk
29. Infection Control Risks identified. Infection Control Risk Assessment (ICRA) required- refer to Enclosure (1).		Yes unless approved by IC
30. Life Safety Risks identified. Interim Life Safety Risk Assessment Form -Attachment (4) - must be completed and submitted.		
31. Emergency Procedures Identified. Fire, severe weather, utility failure, etc.		
32. Demolition will be necessary for the work being conducted.		Yes
33. *New Construction:* Minimum __%__ of total project waste shall be diverted from landfill. Recycled aggregate, Concrete, Steel.		
34. *Interior Remodeling:* Minimum _%___ of total project waste shall be diverted from landfill. a) Ceiling tile b) Steel c) Carpet		

Submitted by (Contractor)_____ Date: _____

Reviewed by (COTR) _____ Date: _____

Reviewed by (CSM) _____ Date: _____

SSSP Required Yes No

(Name) CONSTRUCTION COMPANY

SITE SPECIFIC ACCIDENT PREVENTION PLAN

+

CONSTRUCTION HEALTH AND SAFETY PROGRAM

FOR

Re-Roof 3rd Fl. Day Hospital Roof

Veterans Affairs Medical Center – Wade Park Cleveland, Ohio

Project number given by contracting avoid confusion

PROJECT # 541-15 -206

CONTRACT # VA541-A-XYZ

Template date 4/16/2010

RESPONSIBILITIES AND LINES OF AUTHORITY OF NAME CONSTRUCTION COMPANY

The following people have responsibilities and authority for corporate safety:

BACKGROUND INFORMATION (Prime)

I.	Contractor:	**Name** **Address** **City, State Zip**
II.	Project Name:	**Wade Park Re-Roof 3rd Fl. Day Hospital Roof**
III.	Project Description:	**Brief Description** (541-12-126)
IV.	Contractor Accident Record:	**Contractor provide OSHA Log information**

A. RESPONSIBILITIES

1.	Chief Corporate Safety Officer:	**Contact Name (Contact telephone #)** **Name** Construction Company **Title**
2.	Site Safety Responsibilities:	**Contact Name (Contact telephone #)** **Name** Construction Company **Title**
3.	Project Safety Consulting:	**Contact Name (Contact telephone #)** **Name** Construction Company **Title**

BACKGROUND INFORMATION (SUBCONTRACTOR)

I.	Contractor:	**Name** **Address** **City, State Zip**
II.	Project Name:	**Wade Park Name**
III.	Project Description:	**Brief Description**
IV.	Contractor Accident Record:	**Contractor provide OSHA Log information**

A. RESPONSIBILITIES

1.	Chief Corporate Safety Officer:	**Contact Name (Contact telephone #)** **Name** Construction Company **Title**
2.	Site Safety Responsibilities:	**Contact Name (Contact telephone #)** **Name** Construction Company **Title**
3.	Project Safety Consulting:	**Contact Name (Contact telephone #)**

Name Construction Company
Title

The overall lines of authority concerning safety and health will be as follows:

Name – Title
Name – Title

A Site Safety and Health Officer will be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor and subcontractors. The SSHO will be employed by the prime. SSHO qualifications with education certificates will be listed in Appendix B.

The competent person for Health Hazard Control and Respiratory Protection Program will conduct and document a hazard assessment in accordance with Section 06 to identify and evaluate. (What form of documentation).

Site Safety and Health Officer (SSHO) shall conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors daily quality control report. Current "Safety Logs" shall be readily available upon request.

SIGNATURE SHEET

The following persons are responsible for preparing and approving this plan:

Preparer:

Contact Name (Phone #)
Contact Title
Name Construction Company

_____

Date_____

SCOPE OF WORK SUMMARY

Summary

This job consists of **(Basic Description) Please include the scope of work submitted for the project**

Pre-demolition:

Describe the activity in sufficient detail to determine the safety program elements that will be required to be addressed in the body of the procedure – Section 6. Use the PCRA (Pre-Construction Risk Assessment) along with the Scope of Work to determine which elements need to be addressed for the pre-demolition phase.

Demolition:

Describe the activity in sufficient detail to determine the safety program elements that will be required to be addressed in the body of the procedure – Section 6. PCRA (Pre-Construction Risk Assessment) along with the Scope of Work to determine which elements need to be addressed for each of the demolition phase.

Construction:

Describe the activity in sufficient detail to determine the safety program elements that will be required to be addressed in the body of the procedure Section - 6. PCRA (Pre-Construction Risk Assessment) along with the Scope of Work to determine which elements need to be addressed for the construction phase.

1. **SITE ACCESS:**

a) Parking onsite is not provided by the VAMC Cleveland at the Wade Park Facility

b) Access into the facility will be through entrances located close to the work area to avoid patient care areas. The following entrance that will be used by **Name** Construction Company employees will be submitted in writing or on the drawings:
(Enter the specific building access to be used)

2. **WORK AREA SECURITY:**

a) All **Name** Construction Company employees will wear company identification badges or those provided by VAMC Cleveland Police Service.
b) Patients, visitors and unauthorized VAMC Cleveland employees will be kept out of work areas using locked doors, barricades and safety postings as appropriate.

3. **PLAN FOR PREVENTION OF ALCOHOL AND DRUG ABUSE**
(Review – replace with your own company policy if this doesn't work for you)

a) Due to the nature of our work, it is critical that all employees are free from the adverse effects of drugs and/or alcohol. The company is committed to providing a safe workplace for all its employees. The goal of this policy is to maintain a safe and secure work environment that is free from the effects of alcohol and drug abuse.

b) The intent of this policy is to be responsive to the employees health needs by the early recognition and treatment of chemical dependency problems and behavioral/medical disorder, and to support the rights of the company and its employees to work within an alcohol / drug free environment.

c) This policy is not applicable to physician prescribed drugs. Employees on such medication(s), which may adversely affect their job performance, should promptly discuss the matter with their supervisor.

- Failure of the employee to so notify their supervisor can result in disciplinary action including discharge.
- It should be noted that while legal, prescribed drugs could adversely affect the safety of the employee and other employees on the site.
- All **Name** Construction employees are drug tested before hiring, periodically, and annually.

4. **SITE SAFETY AUDITS (Inspections):**

a) INTERNAL INSPECTIONS

The site supervisor, who is the **Name** Construction competent person, will conduct the Site Safety and Health inspections. The competent person's certifications are located in Appendix B. **(Put the Certifications in the Appendix B.)** There will two types of safety inspections that will be performed on this job site.

(1) A weekly Safety and Health inspection and report will be conducted by the site supervisor. The inspection forms will document and track the following information:

- Any Violations
- Date of violation
- Nature of violation
- Needed corrective action
- Date of correction
- Name of responsible person(s)

(a) In addition to the above items he will also notify any employee and/or subcontractor in writing of any violations.
(b) This information will be followed up on by the COTR or Construction Safety Group, as needed and/or requires immediate attention to the violations. (Should he notify VA of findings?)
(c) All safety inspection forms are reviewed to ensure that all noted corrective actions are within the applicable OSHA and Veterans Affairs Safety and Health Manual guidelines.
(d) This documentation will be kept (readily available?) at the project field office, and will aid in the audits of the Accident Prevention Plan.

(2) The second type of Safety and Health Inspection will be a daily checklist.
(a) This too, will be performed each workday onsite, by the site supervisor.
(b) This documentation will be kept at the project field office, and will aid in the audits of the Accident Prevention Plan. (this too Should be made readily available?)

b) EXTERNAL INSPECTORS/CONSTRUCTION ROUNDS

(1) At various times there may be announced and unannounced visits to the work area of any of the Contracted Construction Projects. They may be visited by
some or all of the members of the Construction Safety Inspection Group.

(2) Prior to the activity of cutting and/or welding, the COTR for the Veterans Affairs will be contacted to assist in scheduling a site inspection and submission for a burn permit.

(3) Prior to any activity including digging and/or excavating, the COTR for the Veterans Affairs will be contacted to assist in scheduling a site inspection and submission for a permit.

(4) Prior to any activity including the renovation and/or penetration of rated walls, the COTR for the Veterans Affairs will be contacted to assist in scheduling a site inspection and submission for a permit.

(5) Prior to any activity including the removal or repair of Asbestos

Containing Building Material, the COTR for the Veterans Affairs will be contacted to assist in scheduling a site inspection and submission for a permit.

c) INSPECTIONS BY OUTSIDE PARTIES i.e., OSHA, EPA, etc.

(1) Presentation of Credentials - Upon arrival at the work site or facility, the Compliance Officer must display his or her credentials and will ask to meet with the appropriate employer representative.

(2) The contractor must notify the projects COTR immediately upon the initial contact of the Compliance Officer's contact.

(3) Opening Conference – During an opening conference, the compliance officer will explain the purpose of the inspection. The contractor's management representative must be prepared to discuss actions that have been taken to demonstrate their company's commitment to the health and safety of employees (e.g. work practices, safety and industrial hygiene standards, safety manuals, training conducted, internal inspections, etc).

(4) An authorized employee representative will be given the opportunity to attend the opening conference and to accompany the compliance officer during the inspection. Employees may also be consulted during the conduct of the inspection. Employees who participate in the inspection, or are consulted by the compliance officer, are protected from discrimination for exercising their safety and health rights under the "Whistle Blowers Act".

(5) A contractor management representative and a VAMC Cleveland Safety representative must accompany the compliance officer during the inspection and keep accurate notes of any actual or possible violations found by the compliance officer. Obvious violations detected by the compliance officer should be corrected on the spot where possible.

(6) It is imperative that existing operations, reports, logs, etc. not be misrepresented to the compliance officer. The penalty for making false statements or representation to OSHA or its compliance officers is a maximum of $10,000 and 6 months imprisonment. In addition, the offending party can be subject to discipline by the company up to and including discharge.

(7) Closing Conference - After the inspection has been conducted, a closing conference will be held between the compliance officer, the employer and employee representatives and VAMC Cleveland. This is the best time, before possible issuance of a citation, to explain the company's position. It is imperative that we question any proposed findings or abatement periods that are unreasonable. Request that any citations be sent to the company with a copy to the VAMC Cleveland safety office.

5. SAFETY TRAINING /EDUCATION:

a) Site orientation training:

All employees on site will be required to attend a Safety Training Orientation at the start of the project, or before they begin work at the job site. The site supervisor, competent person, will conduct the training. Training on the applicable requirements of this Site Specific Training Plan is plan is mandatory and must be documented.

b) Supervisor and employee safety meetings:

The primary site supervisor, who is the competent person (certifications located in Appendix B), will conduct the initial employee site safety orientation. Mandatory safety meetings will be held on a weekly basis. Safety and health topics will vary from week to week on subject matter, utilizing the 29 CFR 1910 and 29 CFR 1926 standards, along with the Veterans Affairs Safety and Health Program and issues raised during construction.

(Place documentation of training sign-in sheets and agenda in Appendix B)

c) Employee training:

Name Construction Company employees will be trained, at the site safety orientation on the following topics:

- When PPE is necessary.
- What PPE is necessary and which PPE has been selected for each process the employee operates.
- How to properly put on, take off, adjust, and wear PPE.

6. ACCIDENT REPORTING:

All **Name** Construction employees on site will be required to attend an "Accident and Event Reporting" Orientation class at the start of the project, or before they begin work at the job site. The site supervisor, competent person, will conduct the above mentioned training.

a) Accident investigations, reports, and logs:

The project manager and site supervisor will conduct all accident and near miss investigations. The site supervisor will maintain the OSHA 300 log. All documentation will be kept on the job site. Certifications for competent person(s) are located in Appendix B.

b) Immediate notification of major accidents:

Should a major accident occur, the following notifications will take place as soon as any injured person(s) are cared for:

Contact Name, Title
Contact Name, Title
Contact Name, Title
VA Safety Representative: Frank Wunderle

Local Emergency Services:

For Wade Park

Hospital	VA Wade Park Medical Facility 10701 East Blvd. Cleveland, Ohio 44106 Dial 2222 from any VA Phone
Hospital	University Hospitals 11100 Euclid Avenue Cleveland, Ohio 44106 911 / (216) 844-1000
Fire Department	911 / 216-664-6813
Security	Dial 4207 from any VA Phone

This listing will be posted in the field office.

c) Accident response plan:

Name Construction Company intends to make certain all emergency incidents are handled in a proper and safe manner giving priority to the following:

- Life Safety
- Property Conservation
- Emergency Situation Investigation
- Return to Normal Operations

d) Exposure data / man hours worked:

(1) This section covers the following operations **(Fill in operation/s requiring additional training)** unless the employer can demonstrate that the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards. Example; (a negative impact statement or asbestos abatement)

(2) This information will be maintained by the site supervisor and verified by **Contact Name**. A daily log will be maintained of all man hours worked. This information will also be used to determine the final TIR for the project. Any data collected will be submitted to the COTR for their report.

7. EMERGENCY RESPONSE PLAN:

This plan covers the actions of all **Name** Construction employees. All subcontractors on site will be required to submit for approval, to **Name** Construction Company, their own site specific Emergency Response Plan. If not adequate, the subcontractor and their employees must be orientated to the **Name** Construction Company's "SITE SPECIFIC EMERGENCY RESPONSE PLAN", before they can begin work at this site.

a) Chemical Safety:

As part of this program, **Name** Construction Company will inform subcontractors, or their representatives of the site emergency response procedures and any potential fire, explosion, health, safety, or other hazards.

The following procedures address emergency response as follows:

- Pre-emergency planning and coordination with outside parties:
  VAMC (COTR) will receive notification of date to start work, along with MSDS's of all substances brought onto the facility.

- Personal roles, lines of authority, training, and communication:

  The personnel utilizing chemicals will contain the substances brought onto the facility. Plumbers will contain and handle all compressed gas cylinders, providing they have been trained and documented.
  In the case where a situation occurs that they cannot handle, all employees will be trained on evacuating the area, notifying the on-site supervisor, and workers in the immediate worksite.

- Emergency recognition and prevention:

  All workers will, at the safety orientation, be informed of this site-specific emergency response plan and procedures.
  All workers will be responsible to recognize hazards and their prevention, practice this at all times on the worksite.
  All workers will be responsible to answer question from surveyors about general safety, health, and emergency procedures wherever they are on site.

b) Emergency plan for severe weather:

For the site-specific severe weather conditions that employees may encounter during the project, **Name** Construction Company has developed the following procedures. First, **Name** Construction Company employees will adhere to all NWS warnings and advisories. For snowfall, the policy for workers is that a Level Three emergency, which is predicted heavy snow fall, or other dangerous weather conditions.

- Safe distances and places of refuge:

  All workers at this site will be informed of the designated location of the safe zone. This will also be posted in the field office for all to be reminded of. In the event of an emergency occurrence, and the Local Fire Department, or any other entity is summoned, all workers will report to this zone to be accounted for.

- Site security and control:

  In the event of an emergency, workers will notify the site supervisor or project manager of the situation, at that time, workers will report to the safe zone. The site supervisor and/or project manager will notify security and any other

applicable authorities. Staying away from the immediate situation and not allowing any unauthorized personnel to enter until proper authorities arrive.

- Evacuation routes and procedures:

Any work will be performed on the interior of the building. Evacuation plans are posted in various locations throughout work area by the VA.

- Decontamination:

This would be required if there is a possibility of a large spill of hazardous material with the potential of contaminating contractor employees. Small spills and personnel contaminations are expected to be cleaned up using the contractors Hazard Communication program and associated MSDS requirements.

c) Medical support:

It will be the duty of all workers onsite, including subcontractors, to immediately report to the site supervisor and/or project manager, COTR's any and all emergencies.

The following are items of concern regarding the handling of all medical support requirements:

(1) On site:

- For incidents occurring on site at Wade Park Veterans Affairs Medical Center; the victim(s) will be stabilized prior to be relocated to another institution.
- For non-emergency support first aid supplies will be kept at the **Name** Construction Company field office. All subcontractors will be required to supply properly trained personnel as well as their own first aid supplies.
- All supplies will be subject to our safety inspections. No one will perform first aid or CPR unless properly trained, and verification of certification is on file at the jobsite.
-

(2) Off site:

- For the Wade Park location, University Hospital Medical Center is located at 11100 Euclid Avenue (216) 844-1000.
- Maps are posted and available for all contractors on site (See Appendix A).
- Emergency medical treatment and first aid:
- Emergency alerting and response procedures:

- It will be the duty of all workers onsite, including subcontractors, to immediately respond to the COTR's, Construction Safety Team or Outside Inspectors from governmental agencies or agencies approving accreditation regarding their function during an emergency.

(3) Posting of emergency telephone numbers:

The posting of these Emergency Telephone Numbers will be in the job field office, where all workers will have access to them. All employees and subcontractors will be made aware of these and the location at the safety orientation. The numbers are as follows:

Hospital	Wade Park Veterans Affairs Medical Center Dial 2222 from any VA Phone University Hospital 911 / (216) 844-1000
Fire Department	911 / (216) 664-6813
Security	Dial 4207 from any VA Phone

d) Hazard communication program:

This site specific Hazard Communication Plan has been implemented in accordance with 29 CFR 1910.1200.

All areas in which hazardous chemicals will be stored shall have the proper label and/or signs. The MSDS for all chemicals on site will be located in a book labeled MSDS, in the project field office.

The training of employees and subcontractors will be as follows:

- Where to find this program
- What is in this program
- All chemicals on this jobsite
- What is an MSDS
- How to find specific information on an MSDS
- Labeling system
- What area these chemicals are stored in, map indicating
- The proper handling procedures for these chemicals
- Spill/release clean up protocol

Should there be an immediate threat to life or property, the emergency response plan for the installation, which is to be on file at the field office.

It is mandatory that all subcontractors submit, before a new chemical is introduced to the worksite, that the proper MSDS is submitted to the site supervisor/project manager. It will be

the responsibility of the site supervisor to inform all employees and subcontractors of the new chemical(s), introduce the MSDS, and the potential hazards of that chemical. The site supervisor and/or project manager will have the responsibility to notify the Contracting Officer / COTR of any and all new chemicals brought onto the facility.

Chemical storage areas, if needed, to be located per VA designated location.

e) CORRECTIVE ACTIONS INVOLVING CLEAN-UP OPERATIONS AT SITES COVERED BY THE RESOURCE CONSERVATION AND RECOVERY ACT OF 1976 (RCRA) AS AMENDED (42 W.S.C. 6901 ET SEQ).

Clean-up operations required by a governmental body, whether Federal, state, local or other involving hazardous substance that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA, NPL, and initial investigations of government identified sites which area conducted before the presence or absence of hazardous substances has been ascertained;

Voluntary clean-up operations at sites recognized by Federal, state, local or other governmental bodies as uncontrolled hazardous waste sites;

Operations involving hazardous waste that area conducted at treatment, storage, disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and Emergency response operations for releases of, or substantial threats of releases of, hazardous substances with regard to the location of the hazard.

8. FIRE PREVENTION PLAN:

We at **Name** Construction Company limit our employees participation to the use of portable fire extinguishers. The site supervisor at safety orientation will cover this Plan. The following topics will include:

a) All areas controlled by the primary contractor are required to maintain fire protection during their occupancy. As a minimum smoke detectors and heat sensors shall be in place whenever the areas original fire protection has been compromised.

b) All fire extinguishers must be checked and tagged every thirty day

c) The general principles of fire extinguisher use and the hazards involved with incipient stage firefighting.

d) Actions to be taken by authorized person(s)
   (1) Evacuate area.
   (2) Notify site supervisor and/or project manager.
   (3) Determine if fire is incipient
   (4) Utilize fire extinguisher.
   (5) If fire or smoke is too great, report to safe zone.
   (6) Make call to Fire Department if instructed by supervisor and/or project manager.

e) Actions to be taken by unauthorized person(s)

(1) Evacuate area
(2) Notify supervisor and/or project manager.
(3) Report to safe zone.
(4) Make call to Fire Department if instructed by site supervisor and/or project manager.

f) Only approved fire extinguishers will be onsite and checked on a daily basis by the site supervisor. These will be located in the following areas, but not limited to:

(1) Portable Fire Extinguishers
(2) Individual Roles and Responsibilities
(3) Fire Watch
(4) Response Plans
(5) Safe Zone
(6) Notification
(7) Site Mapping
(8) Inside field office.
(9) In any area where cutting or welding is taking place

g) The following sections listed below are all part of this Accident Prevention Plan. The information below contains additional requirements that are part of this Fire Prevention Plan:

- Safety and Health Inspections
- Firefighting Plan
- Posting of Emergency Numbers
- Hazard Communication Program
- Site Sanitation Plan

(1) The risk of a job site fire can be avoided through; safety and health inspections, housekeeping, proper maintenance, proper storage and handling, ensuring all employees and subcontractors are performing their designated work duties properly, the handling of supplies and equipment as directed, following all guidelines set forth through operating manuals, instructions, and training,

(2) All employees and subcontractors require the proper storage of combustibles. Combustible liquids must be stored and covered in approved containers.

(3) All chemical spills including, of course, combustible liquids, must be cleaned up immediately.

(4) All chemical and chemical products will be handled and stored in accordance with the procedures noted on their individual MSDS

Note: Care must be taken when cleaning up chemical spills. Information on appropriate personal protective equipment, proper disposal, proper cleanup procedures, required ventilation, etc is found on the products MSDS.

(5) Cleanup materials and damaged containers must be properly disposed.

(6) Combustible liquids and trash must be segregated and stored away from ignition sources.

(7) Approved portable fire extinguishers will be checked on daily basis, ensuring they are charged and ready for use.

(8) Smoking is not permitted inside the facility. Only designated areas by the VA will be permitted (outside), with smoking debris discarded in designated areas..

(9) Debris will not be allowed to accumulate on the job site and will be maintained daily.

h) Submission of a Burn Permit. **Name** Construction will submit a Burn Permit to the COTR to perform acetylene oxygen welding, brazing and cutting, the following precautionary measures will be required as part of this permit along with any additional requirements by the VA Medical Center Policy 138-012 (Hot Work):

(1) Inspect all surroundings and equipment to insure that combustible substances are not present in any area where contact of metal at a temperature above the flashpoint of any compound is possible.

(2) Ensure that no open containers or spills of combustible substances are present.

(3) Ensure that ignition is not possible by conduction, convection, radiation, or dispersion of molten metal.

(4) Proper protection equipment and practices will be used, i.e., fireproof blankets, removal of combustible materials where practicable, and portable fire extinguishers of proper type on hand.

(5) When the above operations are in use a continuous Fire Watch will be performed while equipment is being used.

(6) Training in fire protection will occur at the site safety orientation. This training shall include the following topics, but not limited to:

9. SITE SAFETY RULES:

Name Construction Company has developed a comprehensive safety and health program that addresses our specific safety and health concerns and provides guidance for the performance of our individual job tasks within the framework of appropriate Occupational Safety and Health Administration (OSHA) standards.

Safety requires not only that each person understand and perform individual tasks in a safe manner, but also that each individual is aware of his/her surroundings and is actively involved in the safety and health of others.

a) No Smoking: Smoking is not permitted inside the facility. Only designated areas by the VA will be permitted (outside), with smoking debris discarded in designated areas.

b) Accidents: In the event of an emergency, workers will notify the site supervisor or project manager of the situation, at that time, workers will report to the safe zone. The site supervisor and/or project manager will notify security and any other applicable authorities.

The goals for all projects are as follows:

(1) Zero accident rate
(2) Zero injury/illness rate
(3) Compliance with all applicable Local, State, OSHA standards and Veterans Affairs Safety Directives

c) Hard Hats: Head Protection will be as follows:

- All workers on this site will be required to wear approved hart hats when working in the close proximity of heavy equipment and where structural steel is being hoisted

- In the area where another workers activities may exposing them to injury.

d) Hazard Reporting: Each employee is encouraged to contact their Supervisor immediately should a safety or health risk exist so that corrective action may be taken immediately.

e) Controlled Substances: Therefore, the following actions are strictly prohibited and will prompt disciplinary action up to and including consideration for immediate discharge:

(1) The illegal use, sale, arranging for sale, possession or manufacturing of narcotics, drugs or controlled substances while on the job or on VA property.
(2) The use of alcohol or illegal drugs while on the job or VA property.

f) Safety Devices: **Name** Construction Company has fulfilled all required Safety and Health Plans and Programs according to regulation, and has installed all required safety device for the equipment being used for the tasks. Failure to use or to disable the mentioned safety device relating to CFR 1910 and 1926 standards to ensure 100% safety will be grounds for review .

The goal is to provide the company and its workers protection against those individuals who refuse to act in a consistently safe manner.

Without proper enforcement, the policy will not be able to deliver the intended results. Therefore, it is essential that all employees be held accountable to these guidelines for disciplinary actions up to and including discharge.

g) Personnel Protective Equipment: Procedures for implementing an effective PPE policy in accordance with 29 CFR 1910.132, will be as follows:

(1) During a pre-construction walk through, **Contact Name**, the Project Manager, will perform a job site hazard assessment.

(a) HAZARD ASSESSMENT: The purpose of the survey is to identify sources of hazards to workers and co-workers. The documentation of this hazard assessment is located in PCRA (Pre-Construction Risk Assessment)

(b) POTENTIAL HAZARD SOURCES **(Adjust based on scope of work)**

- **Surfaces that could become slick, uneven walking and working surfaces**
- **Welding / Brazing Hazards**
- **Quality Air Control**
- **Electrical Hazards**
- **Potential Overhead Obstructions (above ceiling)**
- **Fall Protection**
- **Rolling or pinching objects**
- **Sharp objects that might pierce feet or cut hands**
- **Motion that includes tool movement, moving machinery, or machine parts, or movement of personnel that could result in collision with stationary objects.**

(c) EMPLOYEE TRAINING: **Name** Construction Company employees will be trained, at the site safety orientation on the following topics:

- When PPE is necessary.
- What PPE is necessary and which PPE has been selected for each process the employee operates.
- How to properly put on, take off, adjust and wear PPE.

(2) Each of the basic hazards has been reviewed and a determination made as to the type, level of risk, and seriousness of potential injury.

- When exposure to hazards cannot be engineered completely out of normal operations or maintenance work.
- When safe work practices cannot provide sufficient additional protection.
- A Final method of control is through the use of protective clothing or equipment. These include eye protection, steel-toed shoes, hard hats, hearing protection, gloves, and fall protection

(3) Consideration has been given to the possibility of exposure to several hazards at once. The general procedure for determining appropriate protective equipment is to:

- Identify the potential hazards and the type of protective equipment that is available, and what protection it provides.

- Compare the capabilities of various types of PPE with the hazards associated with the environment.
- Select the PPE, which provides a level of protection greater than the minimum required to protect employees from the hazards.
- Select PPE that will fit each employee properly and provides protection from the hazard.
- The Hazard Assessment Worksheet is located in Appendix D.

h) Horseplay: Safety training needs will be identified by continual reassessment of our work methods, equipment and job sites as well as employee and management input. Observation of unsafe acts will be addressed immediately.

i) Reporting Under the Influence:

(1) Arriving at work or working under the influence of alcohol or illegal drugs, narcotics or controlled substances.

(2) Any illegal substance confiscated pursuant to this policy will be turned over to the proper authorities.

j) Flammable Liquid Storage: It is mandatory that all subcontractors submit, before a new chemical is introduced to the worksite, that the proper MSDS is submitted to the site supervisor/project manager. It will be the responsibility of the site supervisor to inform all employees and subcontractors of the new chemical(s), introduce the MSDS, and the potential hazards of that chemical. The site supervisor and/or project manager will have the responsibility to notify the Contracting Officer / COTR of any and all new chemicals brought onto the facility.

k) Heavy Equipment Operation

10. WEEKLY CONTRACTOR REVIEWS:

a) The primary site supervisor, who is the competent person (certifications in Appendix will conduct the initial employee site safety orientation.

b) Mandatory safety meetings will be held on a weekly basis. Safety and health topics will vary from week to week on subject matter, utilizing the 29 CFR 1910 and 29 CFR 1926 standards, along with the Veterans Affairs Safety and Health Program and issues raised during construction.(Place documentation of training sign-in sheets and agenda in Appendix B)

c) Safety takes a commitment from all personnel within our organization. Weekly Training will be interactive with an opportunity for all to actively participate, ask questions, make suggestions, and refer to our written policies and procedures.

11. COMPETENT PERSON:

a) A Site Safety and Health Officer (SSHO) will be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor and subcontractors.

b) The SSHO will be employed by the prime. SSHO qualifications with education certificates will be listed in Appendix B.

d) There will be a competent person for maintaining a Health Hazard Control and Respiratory Protection Program. They will conduct and document a hazard assessment in accordance with Section 06 to identify and evaluate the need and level of protection required for the activities being scheduled. (What form of documentation).

d) Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors daily quality control report. Current "Safety Logs" shall be readily available upon request.

12. WRITTEN PROTOCOLS FOR OUTSIDE INSPECTIONS:

.

a) Presentation of Credentials - Upon arrival at the work site or facility, the OSHA compliance officer must display his or her credentials and will ask to meet with the appropriate employer representative.

b) The contractor must notify the COTR immediately upon the initial OSHA Contact.

(1) Opening Conference – During an opening conference, the compliance officer will explain the purpose of the inspection. Contractor Management representatives must be prepared to discuss actions that have been taken to demonstrate their company's commitment to the health and safety of employees (e.g. work practices, safety and industrial hygiene standards, safety manuals, training conducted, internal inspections, etc).

(2) An authorized employee representative will be given the opportunity to attend the opening conference and to accompany the compliance officer during the inspection. Employees may also be consulted during the conduct of the inspection. Employees who participate in the inspection, or are consulted by the compliance officer, are protected under the OSHA act from discrimination for exercising their safety and health rights.

(3) A contractor management representative and a VAMC Cleveland Safety representative must accompany the compliance officer during the inspection and keep accurate notes of any actual or possible violations found by the compliance officer. Obvious violations detected by the compliance officer should be corrected on the spot where possible.

(4) It is imperative that existing operations, reports, logs, etc. not be misrepresented to the compliance officer. The penalty for making false statements or representation to OSHA or its compliance officers is a maximum of $10,000 and 6 months imprisonment. In addition, the offending party can be subject to discipline by the company up to and including discharge

(5) Closing Conference - After the inspection has been conducted, a closing conference will be held between the compliance officer, the employer and employee representatives and VAMC Cleveland. This is the best time, before possible issuance of a citation, to explain the company's position. It is imperative that we question any proposed findings or abatement periods that are unreasonable. Request that any citations be sent to the company with a copy to the VAMC Cleveland safety office.

13. SUBCONTRACTOR SITE SPECIFIC SAFETY PLAN:

As part of employment with **Name** Construction Company, **employees** are required to comply with all aspects **of their** corporate level "Safety and Health Plan".

- Supervisors are expected and required to comply with all aspects of the corporate level "Safety and Health Plan" as well as to enforce all applicable requirements at the jobsite.

- Supervisors are expected and required to complete all necessary site safety documentation in a complete and timely manner.

- Supervisors are required to report all safety incidents to the main office as soon as possible. The projects COTR is to be notified ASAP. The above items represent the method used to ensure our goals are met.

14. REQUIRED POSTERS:

This Policy Statement will be conspicuously posted in the job site office along with all other required postings including the OSHA Form 300, Log and Summary of Occupational Injuries and Illnesses.

15. SUBCONTRACTOR/SUPPLIERS ORIENTATION PROGRAM:

a) Identification of subcontractors:
Name of Subcontractor (List all subcontractors expected to be on site)

b) Controlling and coordination of subcontractors and suppliers:

Suppliers will be under close supervision during material delivery and pick-up. Communication with suppliers will be important to ensure loads are put in designated areas, and supplier is made aware of any immediate hazards in the area he/she will be in. A project schedule has been coordinated and submitted for approval for the coordination of the scope of work being performed.

c) SAFETY RESPONSIBILITIES OF SUBCONTRACTORS AND SUPPLIERS:

All subcontractors will be responsible to Submit and implement their corporate level Safety and Health Plan as appropriate for the project. Subcontractor shall submit these documents to **Name** Construction Company for approval prior to the start of their activities on the work site. In addition, they will be responsible for adhering to all

applicable OSHA and the Veterans Affairs Safety and Health Program requirements. These documents will be verified through our own site safety inspections and meetings.

In the event that a subcontractor does not have the required safety and health programs, their employees will receive training utilizing **Name** Construction Company's safety and health programs prior to accessing the work site. This training will be documented and compliance with the provisions of **Name** Construction Company's Safety and Health programs will be mandatory as well as being readily accessible.

16. REPORTING OF CATASTROPHIC EVENTS:

It is the policy of **Name** Construction Company to provide a work environment that is inherently safe. The safety and health of our employees is of primary importance as they are our most important resource

- Pre-emergency planning and coordination with outside parties:

  VAMC (COTR) will receive notification of date to start work, along with MSDS's of all substances brought onto the facility.

- Personal roles, lines of authority, training, and communication:

  The personnel utilizing chemicals will contain the substances brought onto the facility. Plumbers will contain and handle all compressed gas cylinders, providing they have been trained and documented.
  In the case where a situation occurs that they cannot handle, all employees will be trained on evacuating the area, notifying the on-site supervisor, and workers in the immediate worksite.

- Emergency recognition and prevention:

  All workers will, at the safety orientation, be informed of this site-specific emergency response plan and procedures.
  All workers will be responsible to recognize hazards and their prevention, practice this at all times on the worksite.

  All workers will be responsible to answer question from surveyors about general safety, health, and emergency procedures wherever they are on site.

- Safe distances and places of refuge:

  All workers at this site will be informed of the designated location of the safe zone. This will also be posted in the field office for all to be reminded of. In the event of an emergency occurrence, and the Local Fire Department, or any other entity is summoned, all workers will report to this zone to be accounted for.

- Site security and control:

  In the event of an emergency, workers will notify the site supervisor or project manager of the situation, at that time, workers will report to the safe zone. The site

supervisor and/or project manager will notify security and any other applicable authorities. Staying away from the immediate situation and not allowing any unauthorized personnel to enter until proper authorities arrive.

- Evacuation routes and procedures:

  Any work will be performed on the interior of the building. Evacuation plans are posted in various locations throughout work area by the VA.

- Decontamination:

  This would be required if there is a possibility of a large spill of hazardous material with the potential of contaminating contractor employees. Small spills and personnel contaminations are expected to be cleaned up using the contractors Hazard Communication program and associated MSDS requirements.

- Emergency medical treatment and first aid:

- Emergency alerting and response procedures:

  It will be the duty of all workers onsite, including subcontractors, to immediately report to the site supervisor and/or project manager, COTR's any and all emergencies

17. Site specific plans to address PCRA:

a. Only those hazards identified as "yes" on the PCRA need to be addressed.
b. Modify the description of the safety precautions as needed to address the specific concern. You may refer to a company policy or company rule book to describe the safety precautions or safety plan; however, we will need to have a copy of your plan or policy on file.
c. To place a check in the box
   - right click on the box
   - Click "Properties"
   - Click "Checked"
   - Click "OK"

Pre Construction Risk Assessment (PCRA)

	Description of safety precautions or reference to contractor Safety Procedures
☐	(1) Respiratory Protection Plan o **Describe of ACTIVITY requiring respiratory protection if applicable** o **NEED documentation of training.** o **Need documentation of fit test.**
☐	(2) Hearing: Protection Plan Any area with noise levels at or above 85dba will be required to wear hearing protection. When workers are utilizing loud equipment, or being exposed to such levels, hearing protection shall be provided.
☐	(3) PPE other: Personal protective equipment (PPE) includes hard hats, gloves, safety glasses, steel-toed shoes/boots, hearing protection, and personal fall protection. Eye protection will be as follows: o Safety glasses used for any worker performing, observing tasks that may result in flying objects, dust, or in the area where another workers activities may exposing them to eye injury. o During welding/cutting operations, the required filter lenses will be utilized according to the operation, electrode size and arc current. Foot Protection: o All workers will be required to wear the appropriate foot protection. o Steel-toed shoes/boots are mandatory. Hand Protection: o Workers may be exposed to hand injuries from; ▪ sharp objects, ▪ abrasive materials ▪ and weather. o Gloves designed to protect against the specific hazard encountered are an effective means of reducing such risks and will be used on this project.
☐	(4) Overhead hazards: **(Example)There will be X critical lifts required on this project. A crane will be utilized to load new materials onto Xth floor roof and remove demolished material from the roof. A plan will be submitted** and approved **prior to this work being performed.**

☐	(5) Confined space: Procedures for entering a confined space depend on the type of confined space and the scope of work associated with the entry. a) The VAMC Cleveland Confined Space Entry Program provides the detailed information necessary for regulatory compliance. The contractor may use the VAMC Program or their own providing that it meets regulatory compliance and is reviewed and approved before entry is made. b) Under no circumstances should a person enter into a posted confined space without notifying the COTR. A "Shutdown Request" reviewd by Occupational Health and Safety and approved by the COTR will be used for this notification. c) Sub-basements are considered non-permit required confined spaces unless welding is performed or other hazards introduced that may create a hazardous atmosphere. When atmospheric hazards are identified then the sub-basements will be worked under the alternate procedure provisions provided that continuous ventilation is used to control the atmospheric hazard. d) Areas posted as "Permit Required" confined spaces will not be entered unless the hazards are eliminated and the space is reclassified. All tanks, voids, ventilation ducts and sewers are considered "Permit Required" confined spaces unless a hazard assessment is conducted and the space is reclassified. e) Employees entering confined spaces will be trained. Training will be based on the Confined Space Entry Program, ANSI National Standard "Safety Requirements for working in Tanks and other Confined Spaces" (ANSI Z117.1), or equivalent training
☐	(6) Ladders: Workers that may be performing work on ladders are instructed to adhere to the following: ▪ Inspect before using ▪ Place ladder using 4 to 1 rule ▪ Never place base of ladder on objects ▪ Never place ladder in front of door unless ▪ Door is blocked in open position ▪ Door is demarcated off ▪ Door is locked
☐	(7) Scaffolding: For work that requires scaffolding use for employees and subcontractors, personal fall protection shall be mandatory, unless working less than 6 ft. The following topics listed will be conveyed to workers prior to scaffolding use ▪ Review scaffolding supplier pamphlet for proper construction ▪ Inspect scaffolding structure before initial use/and daily ▪ Report any defects immediately / do not use / tag out of service ▪ Placement of structure ▪ When fall protection is required ▪ What you can tie off to
☐	(8) Work platforms: Describe type of platform required and specific requirements for its use.

☐	(9)	Fall protection**:** Personal Fall Protection **Name** Construction Company requires all employees working at or above 6' to wear personal fall protection, unless the personal fall protection creates a safety hazard by utilizing it. In that case, other means of fall protection shall be provided.
☐	(10)	Asbestos: As part of the Asbestos program, **Name** Construction Company will inform subcontractors, or their representatives of the site emergency response procedures and any potential fire, explosion, health, safety, or other hazards. The substances listed in Section 13, paragraph c, under MSDS, have the potential to be released or spilled. Section 13.c, Hazard Communication, lists some potential hazards that contractors and/or subcontractors my encounter. Also listed are the response actions to be taken and the proper notification.
☐	(11)	Hazardous materials: The substances listed in Section 13 paragraph c, under MSDS, have the potential to be released or spilled. Section 13 c, Hazard Communication, lists some potential hazards that contractors and/or subcontractors my encounter. Also listed are the response actions to be taken and the proper notification. MSDS sheets must be made available for review by the VAMC and contracted employees.
☐	(12)	Hot work: The **Name** Construction Company will follow VAMC Cleveland's Hot work Policy (MCP 138-012), **Name** Construction will submit a Hot Work Permit to the COTR to perform acetylene oxygen welding, brazing and cutting, the following precautionary measures will be required. ▪ Inspect all surroundings and equipment to insure that combustible substances are not present in any area where contact of metal at a temperature above the flashpoint of any compound is possible. ▪ Ensure that no open containers or spills of combustible substances are present. ▪ Ensure that ignition is not possible by conduction, convection, radiation, or dispersion of molten metal. ▪ Proper protection equipment and practices will be used, i.e., fireproof blankets, removal of combustible materials where practicable, and portable fire extinguishers of proper type on hand. ▪ When the above operations are in use a continuous Fire Watch will be performed while equipment is being used. ▪ Training in fire protection will occur at the site safety orientation.
☐	(13)	Ventilation: **Describe the type of forced ventilation that will be used and the reason it is required. Example: A 500 CFM Red Devil blower will be set up for welding operations in the sub-basement. The exhaust of this blower will be directed to the outside.**
☐	(14)	Power distribution: Describe the circumstances that would make it necessary for disruption of power from the main power lines or associated transformers entering the facility.
☐	(15)	Work being done on energized equipment: Any work to be done on Energized Equipment must be done in accordance with Medical Center Policy (MCP) 138 – 03 (Working on Energized Equipment). The Medical Centers Directors permission

		is required to work any circuit energized. A Energized Circuit Work permit must be approved before starting work.
☐	(16)	Other electric: List Specifics
☐	(17)	Loto: ▪ Only VA Employees will manipulate breakers or valves to perform a Lock Out Tag unless specific permission (in writing) is obtained by the Assistant Chief Engineering, M&O. ▪ The VA will hang Locks or tags on valves or breakers as requested by the project manager. ▪ After the VA places their lock on the device, then **Name** Construction Company will be allowed to place their lock on the device. ▪ When clearing the Lock Out Tag Out, **Name** Construction. ▪ Company will remove **Name** Construction's locks and notify the COTR. ▪ The VA will then remove the VA locks and reposition the valve or breaker at the request of **Name** Construction Company.
☐	(18)	Crane operation: **(Example) There will be X critical lifts required on this project. A crane will be utilized to load new materials onto Xth floor roof and remove demolished material from the roof. A plan will be submitted and approved prior to this work being performed.**
☐	(19)	Excavating; Trenches, ditches – Describe the type, name of competent person, trench boxes required and if necessary air sampling requirements.
☐	(20)	Earthmoving: **(Example)** The use of this equipment will be required on this project for moving of earth. Safety will be the responsibility of the company performing the work.
☐	(21)	Industrial trucks: **(Example)** The use of this equipment will be required on this project for loading materials onto the X^{th} floor roof. Industrial truck safety will be the responsibility of the company performing the work.
☐	(22)	Other motorized equipment: List type and specific use. Only qualified operators will be allowed to operate motorized equipment. Diesel powered equipment will not be used near medical Center Ventilation Intakes.
☐	(23)	Concrete, Masonry operations: Describe the work to be performed and what fall protection will be provided for workers on forms that are higher than six feet.
☐	(24)	Steel Erection: Describe the type of steel erection, fire protection coatings used and fall protection requirements if not already addressed in (10) Fall Protection.
☐	(25)	Alteration or Improvement of existing Electrical transmission and distribution lines and equipment. – Describe the scope of work and provisions made to ensure that the facility does not lose power during the work.
☐	(26)	Hand & portable tools

a) Hand Tools

.1 For your own protection, do not misuse your tools. Use tools only for the purpose for which they were designed.
.2 Your job will be easier and much safer if tools are in good condition. Take care in handling and storing tools.
.3 You and the person in charge must be satisfied that all the tools you use on the job, whether they are Company- or personally-owned, are in safe condition.
.4 Tools with mushroomed heads, loose, split or broken handles, broken screw drivers, defective pliers, wrenches with spread jaws, defective cords, ground wires and plugs, etc., must not be used.
.5 Never use a defective tool. Defective tools are to be removed from service and marked defective.
.6 For your own protection, do not misuse your tools.
.7 Cover sharp-edged and pointed tools with scabbards and guards. Always use the guards when the tools are not in use.
.8 Never strike the hardened part of one tool against the hardened part of another tool or against any hardened surface.
.9 Never use a file with a tang unless it is equipped with a handle.
.10 Never throw tools from one person to another or from one level to another.
.11 Hot tools, equipment or materials on tables or benches, even if they are metal covered, shall be properly identified.
.12 Never use improper handles when you work with jacks. Always remove handles when they are not being used.
.13 Never use metal-shielded spotlights or flashlights around exposed electrical equipment.

b) Extension Cords

.1 Use only approved extension cords and lamp guards. Extension cord lamps used in explosion-hazard atmospheres, such as oil vapor or flammable gases, must be equipped with guards and vapor-proof globes. Do not use a lamp with a switch.
.2 When you use an extension cord around switchboards, switch structures or electrical equipment, it must have a non-metallic socket and guard.
.3 Use only specially approved low voltage (6 or 12 Volt) extension cords or ground fault circuit interrupter (GFCI) when you need portable lighting in wet locations. This type of cord should be used when you work outdoors, in tanks or in other areas where moisture or condensation may be a hazard.
.4 Use GFCI protected circuits where required by the electric code. If there is a question about the requirements, contact Engineering Service for resolution.

c) Tool Containers

.1 Cover any grating to prevent your tools or material from falling. When you are working on scaffolds or platforms, use a suitable container for any of your tools that are not actually being used.

d) Power Tools

.1 Always wear the proper personal protective equipment including but not limited to eye protection.

.2 Before you use any power tool, check to make sure:

- .it is properly tested;
- all guards are in place;
- all material is properly secured;
- you disconnect the tool electrically before inserting or removing any attachments; and
- you use GFCI protected circuits when required.

.3 While a machine is in operation:

- never remove chips with your hand; always use a suitable brush, hook or stick;
- do not let the machine run unattended;
- do not place tools or materials on machines where they can be jarred or pushed off;
- never try to stop a machine using your hands or any other part of your body as a brake; and
- both hands shall be used when working with portable tools.

.4 You must unplug power tools when they are left unattended. You must shut off and de-pressurize (bleed down) pneumatic- or hydraulic-operated tools when they are left unattended.

.5 Keep the floor around machines clean and free from oil. If you spill any oil, wipe it up immediately or use an oil absorbent. Slipping is one of the most common causes of accidents.

.6 Carefully inspect grinding machines before you use them. Be sure that:

- you perform a ring test prior to installing a new wheel;
- the wheel is secure on the driving shaft;
- the wheel is in good condition; dress or replace the wheel as necessary;
- the work rest is adjusted properly; and
- the safety guard is in place and allows proper visibility to do the work.
- Do not use the side of the wheel for grinding, unless it is specifically designed for side grinding.
- Many wheels cannot stand up under side grinding.
- Never drive a grinding wheel at speeds above that specified by the manufacturer.
- When you grind small objects, hold them firmly in place with a suitable tool, not with your fingers.
- Do not grind soft metals such as aluminum

☐ (27) Compressed Gasses: Compressed gas cylinders may be used at this worksite. These cylinders and gases present an injury hazard in the event that a regulator or cylinder is damaged and/or broken. The particular gases used will be **(Name Gas).** These hazards will be reduced by routine inspections and maintenance of compressed gas cylinders and by assuring all the units are secured from tipping. Safety caps will be installed on all cylinders that are not in use.

		Compressed gas cylinder will be kept away from excessive heat, will not be stored where they might be damaged or knocked over by passing or falling objects. The storage of oxygen and fuel gas compressed cylinders will be separated by at least 20 ft.
☐	(28)	Other hazardous activities **(Name and describe safety precautions)**
☐	(29)	Infection Control : Infection Control (216-791-3800 Ext 4791) has been contacted for work in patient care or high risk areas to conduct an Infection Control Risk Assessment (ICRA). Provisions of the ICRA will be followed unless changed by Infection Control.
☐	(30)	Life Safety: Occupational Health and Safety 216-791-3800 Ext 4172 has been contacted to conduct a Life Safety Risk Assessment. Interim Life Safety measures have been determined and will be posted outside of the construction area. Fire extinguishers will be provided inside the construction area and they will be inspected at a minimum of 30 day intervals. Provisions of the Interim Life Safety measures will be followed unless modified by Occupational Health and Safety. If penetrations are made in smoke/fire barriers the COTR will verify that they have been appropriately sealed before project completion.
☐	(31)	Emergency Procedures: Standard Emergency Response Plan is described in section 7. Additional provisions required for rescuing employees working at heights or working in Permit Required Confined Spaces will be as follows: **Describe Specifics**
☐	(32)	Demolition: Demolition is described in the Scope of Work Summary. Collection of demolition debris for recycling will minimize dust generation. All containers will be covered and employees will use appropriate methods for controlling the spread of dust outside the construction zone.
☐	(33)	New Construction Recycling: A minimum of X% of total project waste will be diverted to a landfill. a) Concrete b) Steel
☐	(34)	Interior Remodeling Recycling: A minimum of X% of total project waste will be diverted to a landfill. a) Ceiling Tile b) Steel c) Carpet
☐	(35)	General Recycling: The following categories of waste shall be diverted from a landfill (Check all that apply):
	☐	Green Waste (Biodegradable landscaping material)
	☐	Soil
	☐	Inserts (concrete, asphalt, masonry)
	☐	Clean dimensional wood, palette wood
	☐	Engineered wood products, plywood, particle board, I joints, etc.
	☐	Cardboard Paper packaging
	☐	Asphalt Roofing materials

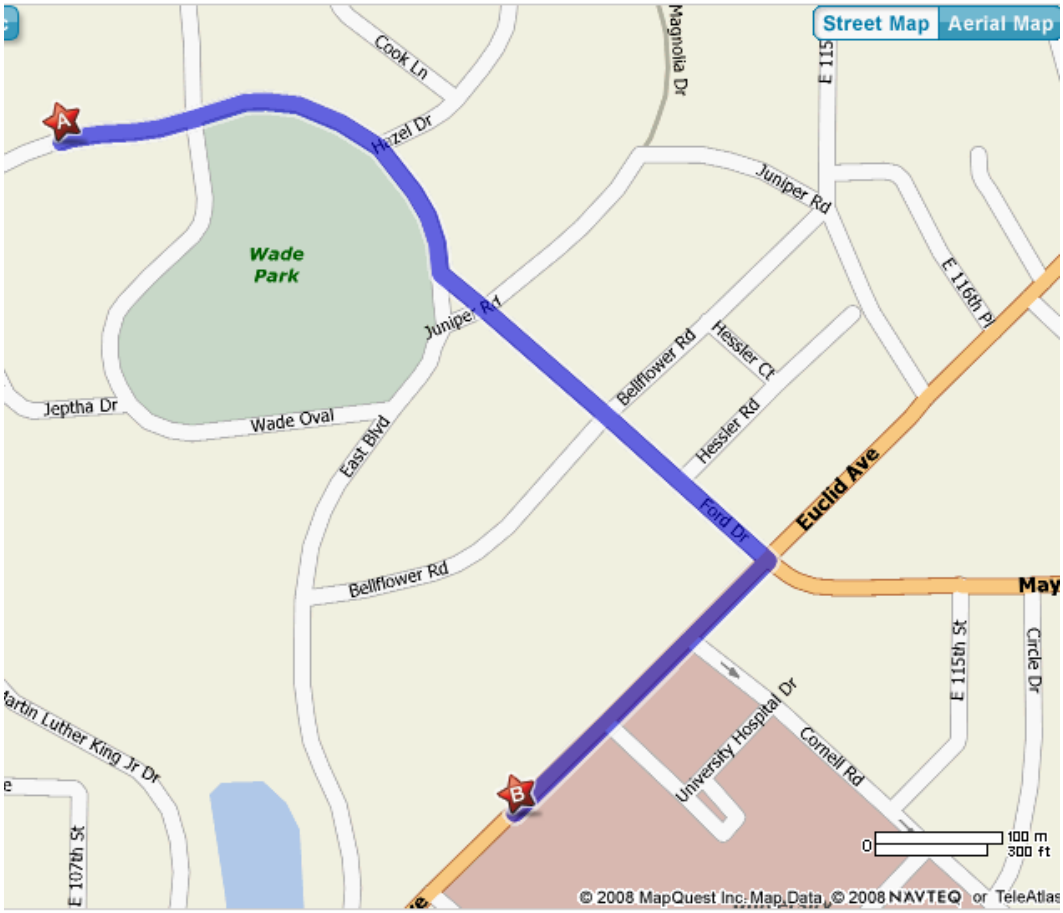
	☐	Insulation
	☐	Gypsum board
	☐	Carpet and pad
	☐	Paint
	☐	Plastics: ABX, PVC
	☐	Beverage containers

APPENDIX A

Evacuation Routes Work Zone Layouts and Maps to Emergency Services

Contractor and subcontractors working in the Medical Center will follow the posted exit signs and maps to evacuate the medical Center. To ensure all employees have been evacuated, they will meet at **(Location).**

Map from VAMC Cleveland (Wade Park Division) to University Hospital



APPENDIX B

CERTIFICATIONS
&
JOBSITE DOCUMENTATION PROGRAM

List all individuals including their titles, who have completed

1. **OSHA 30 Hour Construction Safety Course**
2. **OSHA 10 Hour construction Safety Course**
3. **Competent Person Certifications for Respiratory Protection, Fall Protection, Trenching and Shoring, etc. as required by the Scope of Work and applicable regulations.**

APPENDIX C

CONTRACTOR ACCIDENT RECORD

OSHA 300 FORM

To be updated and maintained in the on site construction office or the service company if an office is not located on station.

Site Specific Safety Plan Review Sheet

Project:_____ Date: _____

Plan Element	Yes	No	See Comments
1. Site Access and Control.			
2. Site Security.			
3. Substance Abuse Policy.			
4. Site Safety Audits (Inspections).			
5. Safety Training/Education Agenda.			
6. Accident Reporting and Investigation.			
7. Emergency Action Plan			
8. Fire Protection and Prevention.			
9. Site Safety Rules.			
a. *No Smoking*, except in designated areas.			
b. *All* accidents, no matter how minor, shall be reported immediately to your supervisor.			
c. Hard hats, construction-grade safety shoes, safety glasses, long pants, and shirts (with minimum 1/4-length sleeve) *must* be worn while on site.			
d. Report all hazards immediately to your supervisor.			
e. The possession, use, sale or distribution of controlled substances or alcohol on site is strictly prohibited, and is grounds for immediate dismissal.			
f. The overriding or defeating of any safety device is strictly prohibited and grounds for immediate dismissal.			
g. Failure to wear personal protective equipment when and where applicable is grounds for immediate dismissal.			
h. Horseplay is strictly prohibited and is grounds for immediate dismissal.			

i. Reporting for work under the influence of drugs and/or alcohol is grounds for immediate dismissal.			
j. Flammable liquids and gases shall be stored in approved containers, and marked with content and appropriate hazard warnings.			
k. Only authorized employees shall be allowed to operate heavy equipment. Do not use tools for which you have not been trained. Contact your supervisor for appropriate training.			
10. Scheduling of weekly contractor safety reviews, site safety training, employee site orientation			
11. Provisions for Identification of Competent Person.			
12. Written protocols for addressing inspections by outside parties, i.e.,			
13. The General Contractor should receive and review the subcontractors Safety Plan to ensure the program is compliant with the site-specific plan. Subcontractors should be required, at a minimum, to submit written protocols relative to the hazards primary to the contractors line(s) of work (i.e., cranes, trenching and excavation, scaffolding, etc.).			
14. The required posters informing all employees of their rights and responsibilities should be posted in a prominent location within the workplace.			
15. A subcontractor orientation program			
16. Reporting of any fatality or catastrophic accident within 8 hours to the nearest OSHA Regional Office. Additionally, it is required that the local facility Safety Officer be included in this report chain.			
17. Specific Plans to address hazards identified on the Hazardous Work Activity Checklist.			

	Plan not approved
	Plan Approved as Written
	Plan approved with the following items needed before a specific activity can begin

	Activity	Required documentation
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Comments:

Construction Safety Manager	

SECTION 01 31 70
SPECIAL PROJECT CONDITIONS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies special project conditions.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. All divisions.

1.3 SPECIAL PROJECT CONDITIONS

A. The Contractor is responsible for the protection of all vegetation, persons, real property, and personal property on the site and the adjoining Rights-Of-Way from the work associated with this project. Any damaged items shall be replaced or repaired to the satisfaction of the Owner. The Contractor may not impede the ongoing operations of the Hospital and must cooperate fully with the Hospital throughout the project to ensure Hospital operations are not negatively impacted for the duration of the project. Costs associated with Contractor alterations, work stoppage, set-up moves, and the like are to be part of the contract price and will not be considered “adds” by the contract parties.

B. The Contractor is responsible for daily clean-up of all debris and protection of all persons and property in and around the work areas. Any soiling of or damage to vehicles, pedestrians, personal property or real property from this project will be the responsibility of the Contractor.

C. The Contractor shall not discontinue this project once work has commenced. A full crew must be on site performing appropriate contract work any day during which work can be performed.

D. Unapproved subcontractors or joint ventures cannot be used on this project. The General Contractor must have personnel on-site to supervise all subcontracting work at all times. All subcontractors are subject to the COR’s approval.

E. When masonry/window/curtain wall/door/storefront replacement or reinstallation occurs, the Contractor must perform the following at a minimum:
1. Cordon off and create an air barrier around the area for replacement.
2. Have an employee in the interior during all replacement activity.
3. No windows/curtain walls may be removed unless the resulting opening can be made watertight the same workday.
4. The entire exterior envelope, wall and roof components, must stay completely weathertight at all times throughout the project and the Contractor needs to ensure, no matter what the weather forecast says, that the building is 100% weathertight before leaving each and every day of the project. Weathertight means no rain, snow, hail, wind, insects, etc., may enter from the exterior to the interior.

5. Additionally, without any increase in contract price, further steps shall be taken by the contractors, as necessary, or deemed necessary by the Owner, to eliminate all safety concerns and health concerns that may arise during the project, and allow Hospital operations to continue unimpeded.

F. The Contractor is fully and solely responsible to secure and keep completely weathertight and dry at all times all installed and/or stored materials; as well as to secure all equipment daily. In addition, the contractor is fully and solely responsible to keep all work areas weathertight and secure at all times throughout the project.

G. The work day is limited to Cleveland City Ordinance requirements or as approved by the COR.

H. The building will be occupied during the project. Therefore, the Contractor is fully and solely responsible for the safety and protection of all persons entering, exiting, and/or occupying the interior of the Building, to the COR's satisfaction at the COR's sole discretion. All costs associated with providing this protection shall be included in the bid amount(s).

I. The Contractor shall gain access to the roof areas and masonry areas from the building exterior only. OSHA–compliant temporary means of access to these areas shall be supplied by the Contractor. Interior access will only be allowed for necessary work, such as drain installation. All interior work must be coordinated in advance with the COR. The Contractor must be fully cooperative with the directives of the COR: no additional funds will be paid for this coordination effort.

J. All roofing, including sheet metal installation, must be completed prior to beginning work on another roof area, as defined on the drawings.

K. Weather delays may not extend the schedule, as defined in the terms of the Contract Documents, unless specifically approved in writing by the Contracting Officer, at the Contracting Officer's sole discretion. Only weather delays over and above normal historical weather patterns will be cause to request a contract extension, which may or may not be agreed to by the Contracting Officer.

L. All areas of roof application must be performed in a way that ensures that all roof areas have proper and unrestricted drainage. Direct, free flowing access, to a properly operating and active roof drain assembly, without elevation change or restriction of any kind, must be maintained at all times.

M. All debris must be removed from the interior of the building, prior to the installation of new deck materials. Clean-up of debris must be complete in nature and to the COR's satisfaction.

N. A "Rhino" roofing removal machine may not be used for roof removal on any type of deck.

O. The Contractor shall be responsible for the permanent raising and/or temporary removal and reinstallation of all roof top accessories and equipment, including existing insulated rooftop ductwork, and including all new structural supports, revised duct transitions, and re-insulation to match the new roof height and conditions. Requests for temporary shut-downs of HVAC systems related to any disassembly of equipment or ductwork shall be submitted to the COR at least two weeks prior to the proposed shut-down and must identify the specific equipment to be shut-down and include the duration of the requested system shut-down; note that any such shut-down(s) may only occur after 5 PM on weekdays or as scheduled on

weekends. The Contractor shall verify to the COR in advance of any system shut-down that all materials required to accomplish the required work during the shut-down are on-site and that all related preparatory work has been performed so as to minimize the length of the shut-down.

P. The Contractor shall include all costs associated with raising of rooftop units, gas lines, soil stacks, conduits, etc.; or with repositioning the same to ensure designed and proper flashing heights and roof system installation in the contract amount. This includes costs involved in evacuating and charging HVAC equipment and gas lines. Note that work may need to be performed off-hours to accommodate the COR. No additional cost will be incurred by the Owner. The Contractor must also use COR approved and licensed Subcontractors for all work of this type.

Q. The Contractor must call Ohio Utilities Protection Service prior to setting up the project.

R. The dumpster must be tightly covered throughout the project to control dust and debris. An enclosed chute must be used that is also completely able to control dust and debris. In addition, dumpsters shall be removed immediately once they become filled.

S. General location of Staging Area is denoted on the drawing set and Contractor shall propose the configuration and layout for approval by the COR. This includes the installation of a temporary chain link fence around the ground set-up area.

T. No radios, loud talking, profanity, or comments to any persons on the Hospital grounds are to be permitted.

U. No materials traffic and/or human traffic may occur over installed roof membrane and/or overburden components except for the installation of the roof insulation, protective membrane roof panels, pavers, and associated sheet metal components. Further, no storing of materials will be permitted on the installed roof membrane and/or overburden. Therefore, the contractor must sequence the roof installation to ensure the membrane and/or finished roof system does not get trafficked during work on the next roof area, for both roof removal debris and new product delivery and installation.

V. All debris must be removed from the interior of the building and from the cavity components of the subject work, prior to the installation of new materials. Clean-up of debris must be complete in nature and to the Owner’s satisfaction.

W. All vision glass at locations where the crewmembers will be in close proximity to such windows shall be covered with a strippable masking film prior to any work commencing. Clean the glass and components well prior to application for easy of future removal. Note that multiple applications, including removal and replacement, may be necessary depending on how long masking remains in place, depending on masking manufacturer’s directions.

X. All masonry restoration and replacement work must be completed prior to the removal and replacement of the roof components.

Y. The Cementitious Surfaced Foam Insulation Manufacturer shall engage and pay for an independent Building Exterior Consultant, who has at least 3 years of experience with observing EIP Composite PRMA roofs, to observe all of the Contractor’s work for all technical specification scopes of work on a full time basis each day the Contractors’ personnel are on site.

Z. The following is a list of core results. These results are for informational purposes only. The accuracy of the results is not guaranteed. The Contractor is encouraged to verify any and all results as they deem necessary. There will be no additional moneys allocated in the event that the stated results are inaccurate.

a. Roof 3A
   1. Membrane: PIB single ply membrane
   2. Insulation: 3″ flat polyisocyanurate over tapered polyisocyanurate
   3. Membrane Organic Asphalt BUR vapor retarder
   3. Deck: Concrete

b. Roof 3B
   1. Membrane: PIB single ply membrane
   2. Insulation: 3″ flat polyisocyanurate over tapered polyisocyanurate
   3. Deck: Concrete

c. Roof 3C
   1. Membrane: PIB single ply membrane
   2. Insulation: 3″ flat polyisocyanurate over tapered polyisocyanurate
   3. Deck: Concrete

1.4 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

A. Before submitting a Bid, each Bidder may observe the physical conditions at the site which may affect cost, progress performance and/or furnishing of the Work and which Bidder deems necessary to determine the Bid for performing and furnishing the Work in accordance with the time, cost, and the terms and conditions of the Contract Documents.

B. Each Bidder’s access to the site to conduct site observations, as each Bidder deems necessary for submission of a Bid, shall be limited to the scheduled Pre-Bid Meeting, unless otherwise agreed to by the Contracting Officer. Bidder shall restore the site to its former conditions upon completion of site observations.

C. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder will comply with every requirement of the Contract Documents and that, without exception, the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of the terms and conditions for performance and furnishing of the Work, except for concealed existing conditions.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

- - - END - - -

SECTION 01 32 16.13
CONSTRUCTION PROGRESS SCHEDULES

PART 1- GENERAL

1.1 DESCRIPTION:

A. The Contractor shall develop a Construction Progress Schedule plan and schedule demonstrating fulfillment of the contract requirements, shall keep the Cost-Loaded CPM Schedule up-to-date in accordance with the requirements of this section and shall utilize the plan for scheduling, coordinating and monitoring work under this contract (including all activities of subcontractors, equipment vendors and suppliers). Conventional Critical Path Method (CPM) Precedence Diagramming Method (PDM) technique will be utilized to satisfy both time and cost applications. All schedule data and reports required under this specification section shall be based upon regular total float, not relative total float schedules.

B. Contractor shall not perform any work onsite until the schedule associated with that work is first approved by the VA.

1.2 CONTRACTOR'S REPRESENTATIVE:

A. The Contractor shall designate an authorized representative in the firm who will be responsible for the preparation of the contract schedule, review and report progress of the project with and to the Contracting Officer's representative.

B. The Contractor's representative shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the requirements of this specification section and such authority shall not be interrupted throughout the duration of the project.

1.3 CONTRACTOR'S CONSULTANT

A. To prepare the schedule, and electronic copy, which reflects the Contractor's project plan, the Contractor shall engage an independent CPM consultant who is skilled in the time and cost application of scheduling using Cost Loaded CPM Schedule techniques for construction projects, the cost of which is included in the Contractor's bid; or as prepared by Contractor’s own qualified staff member.

1.4 COMPUTER PRODUCED SCHEDULES

A. The Contractor shall provide to the VA, weekly computer processing of all computer-produced time/cost schedules and reports generated from monthly project updates. This monthly computer service will include: three copies of up to five different reports (inclusive of all pages) to the contracting officer’s representative; a hard copy listing of all project

schedule changes, and associated data, made at the update; and the resulting monthly updated schedule. These must be submitted with and substantively support the contractor’s monthly payment request and the signed report. The COTR shall identify the five different report formats that the contractor shall provide based upon the monthly schedule updates.

B. The Contractor is responsible for the correctness and timeliness of the computer-produced reports. The Contractor is also responsible for the accurate and timely submittal of the updated project schedule and all CPM data necessary to produce the computer reports and payment request that is specified.

C. The VA shall report errors in computer-produced reports to the Contractor’s representative within ten calendar days from receipt of reports. The Contractor will reprocess the computer-produced reports and associated compact disk(s), when requested by the Contracting Officer’s representative, to correct errors which affect the payment and schedule for the project.

1.5 THE COMPLETE PROJECT SCHEDULE SUBMITTAL

A. Within 14 calendar days after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's review; three blue line copies of the complete Cost Loaded CPM Schedule diagram on sheets of paper 765 x 1070 mm (30 x 42 inches). The submittal shall also include three copies of a computer-produced activity/event ID schedule showing project duration; phase completion dates; and other data, including event cost. Each activity/event on the computer-produced schedule shall contain as a minimum, but not limited to, activity/event ID, duration, predecessor and successor relationships, trade code, area code, description, budget amount, early start date, early finish date, late start date, late finish date and total float. Work activity/event relationships shall be restricted to finish-to-start only without lead or lag constraints. Activity/event date constraints, not required by the contract, will not be accepted unless submitted to and approved by the Contracting Officer. The contractor shall make a separate written detailed request to the Contracting Officer identifying these date constraints and secure the Contracting Officer’s written approval before incorporating them into the Cost Loaded CPM Schedule diagram. The Contracting Officer’s separate approval of the Cost Loaded CPM Schedule diagram shall not excuse the contractor of this requirement. Logic events (non-work) will be permitted where necessary to reflect proper logic among work events, but must have a zero duration. The complete working Cost Loaded CPM Schedule diagram shall reflect the Contractor's approach

to scheduling the complete project. The final schedule in its original form shall contain no contract changes or delays which may have been incurred during the final schedule development period and shall reflect the Contractors as bid schedule. These changes/delays shall be entered at the first update after the final Cost Loaded CPM Schedule diagram has been approved. The Contractor should provide their requests for time and supporting time extension analysis for contract time as a result of contract changes/delays, after this update, and in accordance with Article, ADJUSTMENT OF CONTRACT COMPLETION.

B. Within 14 calendar days after receipt of the complete project schedule, the Contracting Officer or his representative will or accept or reject the schedule.

C. The VA will process and return the approved baseline schedule data to the contractor for subsequent project schedule reporting and updating. The approved baseline schedule and the corresponding computer-produced schedule(s) shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this section.

D. The Complete Project Cost Loaded CPM Schedule Diagram will contain approximately 100 work activities/events.

1.6 WORK ACTIVITY/EVENT COST DATA

A. The Contractor shall cost load all work activities/events except procurement activities. The cumulative amount of all cost loaded work activities/events (including alternates) shall equal the total contract price. Prorate overhead, profit and general conditions on all work activities/events for the entire project length. The contractor shall generate from this information cash flow curves indicating graphically the total percentage of work activity/event dollar value scheduled to be in place on early finish, late finish. These cash flow curves will be used by the Contracting Officer to assist him in determining approval or disapproval of the cost loading. In the event of disapproval, the Contractor shall revise and resubmit in accordance with Article, THE COMPLETE PROJECT SCHEDULE SUBMITTAL. Negative work activity/event cost data will not be acceptable, except on VA issued contract changes.

B. The Contractor shall cost load work activities/events for guarantee period services, test, balance and adjust various systems in accordance with the provisions in the General Conditions, Article, PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (VA GENERAL CONDITIONS).

C. In accordance with Article PERFORMANCE OF WORK BY THE CONTRACTOR in the Section 01 00 00, GENERAL REQUIREMENTS, the Contractor shall submit, simultaneously with the cost per work activity/event of the construction

schedule required by this Section, a responsibility code for all activities/events (referred to as "branches" in the Section 01 00 00 GENERAL REQUIREMENTS) of the project for which the Contractor's forces will perform the work.

D. The Contractor shall cost load work activities/events for all BID ITEMS. The sum of the cost loading for each bid item work activities/events shall equal the value of the item in the Contractors' bid.

E. Work activities/events for Contractor bond shall have a trade code and area code of BOND.

1.7 SCHEDULE REQUIREMENTS

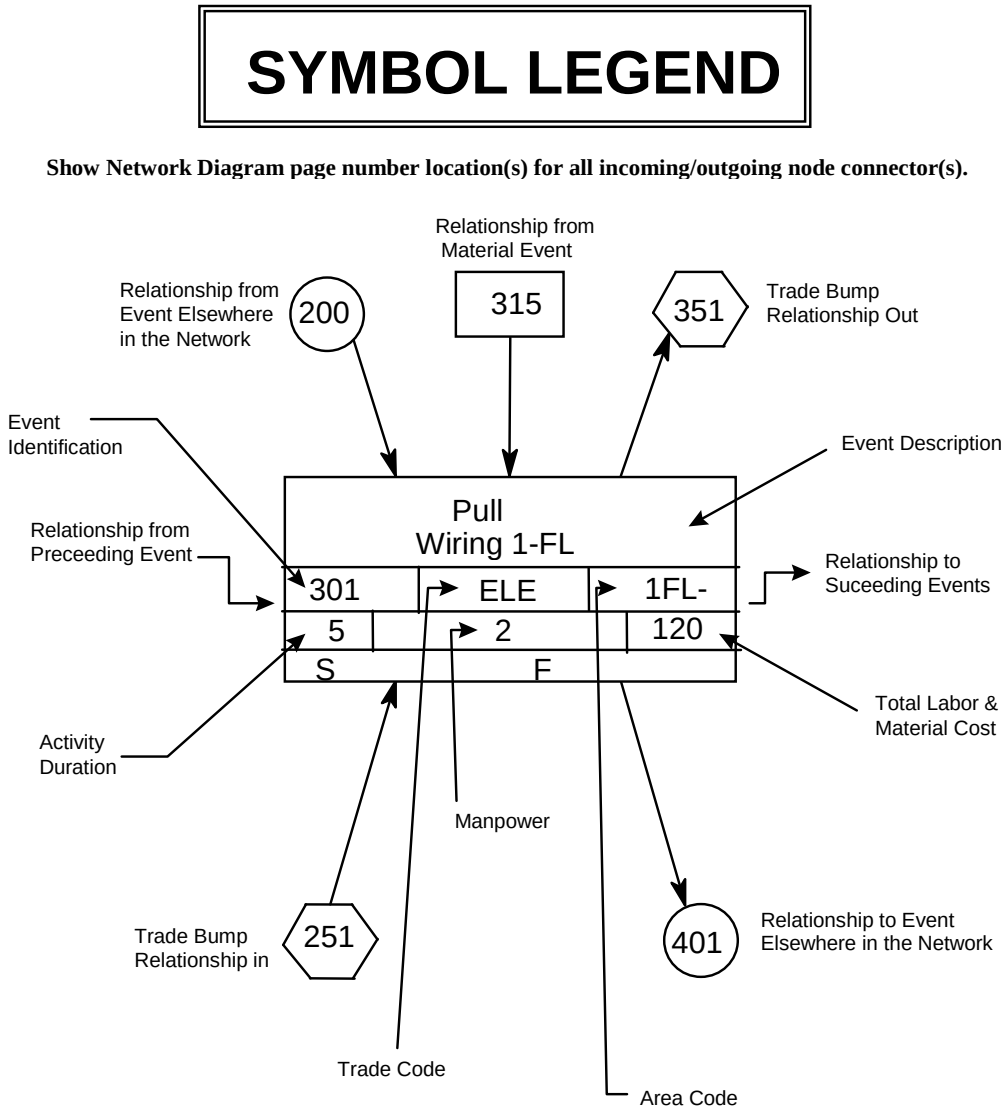
A. Show on the Cost Loaded CPM Schedule diagram the sequence and interdependence of work activities/events required for complete performance of all items of work. In preparing the Cost Loaded CPM Schedule diagram, the Contractor shall:

1. Exercise sufficient care to produce a clear, legible and accurate Cost Loaded CPM Schedule diagram, refer to the drawing, CPM-1 (Sample CPM Cost Loaded CPM Schedule). Computer plotted Cost Loaded CPM Schedule diagrams shall legibly display and plot all information required by the VA CPM activity/event legend or the computer plotted Cost Loaded CPM Schedule diagram will not be acceptable. If the computer plotted Cost Loaded CPM Schedule diagram is not found acceptable by the contracting officer’s representative, then the Cost Loaded CPM Schedule diagram will need to be hand drafted and meet legibility requirements. Group activities related to specific physical areas of the project, on the Cost Loaded CPM Schedule diagram for ease of understanding and simplification. Provide a key plan on each Cost Loaded CPM Schedule diagram sheet showing the project area associated with the work activities/events shown on that sheet.
2. Show the following on each work activity/event:
   a. Activity/Event ID number.
   b. Concise description of the work represented by the activity/event. (35 characters or less including spaces preferred).
   c. Performance responsibility or trade code (five alpha characters or less): GEN, MECH, ELEC, CARP, PLAST, or other acceptable abbreviations.
   d. Duration (in work days.)
   e. Cost (in accordance with Article, ACTIVITY/EVENT COST DATA of this section and less than $9,999,999 per activity).

f. Work location or area code (five characters or less), descriptive of the area involved.

g. Manpower required (average number of men per day).

h. The SYMBOL LEGEND format shown below is mandatory and shall be followed in preparing final Cost Loaded CPM Schedule diagrams per 1.5 A.



3. Show activities/events as:

a. Contractor's time required for submittal of shop drawings, templates, fabrication, delivery and similar pre-construction work.

b. Contracting Officer's and Architect-Engineer's review and approval of shop drawings, equipment schedules, samples, template, or similar items.

c. Interruption of VA Medical Center utilities, delivery of Government furnished equipment, and rough-in drawings, project phasing and any other specification requirements.

d. Test, balance and adjust various systems and pieces of equipment, maintenance and operation manuals, instructions and preventive maintenance tasks.
e. VA inspection and acceptance activity/event with a minimum duration of five work days at the end of each phase and immediately preceding any VA move activity/event required by the contract phasing for that phase. Schedule these activities/events so that only one phase is scheduled for completion within the same 30 consecutive calendar day period (except for those phases immediately preceding the final acceptance). Maintain this scheduling condition throughout the length of the contract unless waived by the Contracting Officer’s representative in writing.
f. Work activities/events for the asbestos abatement bid item shall have a trade code of ASB.
g. Bid items other than the Base Bid (ITEM 1) and Asbestos Abatements item shall have trade codes corresponding to the appropriate bid item number (e.g., ITM 4 and other items).

4. Show not only the activities/events for actual construction work for each trade category of the project, but also trade relationships to indicate the movement of trades from one area, floor, or building, to another area, floor, or building, for at least five trades who are performing major work under this contract.
5. Break up the work into activities/events of a duration no longer than 20 work days each, except as to non-construction activities/events (i.e., procurement of materials, delivery of equipment, concrete and asphalt curing) and any other activities/events for which the Contracting Officer may approve the showing of a longer duration. The duration for VA approval of any required submittal, shop drawing, or other submittals shall not be less than 20 work days. Refer to drawing CPM-1 for VA approval activities/events which will require minimum duration longer than 20 workdays. The construction time as determined by the CPM schedule from early start to late finish for any sub-phase, phase or the entire project shall not exceed the contract time(s) specified or shown.
6. Describe work activities/events clearly, so the work is readily identifiable for assessment of completion. Activities/events labeled "start," "continue," or "completion," are not specific and will not be allowed. Lead and lag time activities will not be acceptable.
7. Uniquely number each activity/event with numbers ranging from 1 to 99998 only. The schedule should be generally numbered in sequence;

left to right; top to bottom, and omitted numbers ending in 3, 6, and 9.

B. Submit the following supporting data in addition to the Cost Loaded CPM Schedule diagram, activity/event ID schedule and electronic file (s). Failure of the Contractor to include this data will delay the review of the submittal until the Contracting Officer is in receipt of the missing data:
   1. The proposed number of working days per week.
   2. The holidays to be observed during the life of the contract (by day, month, and year).
   3. The planned number of shifts per day.
   4. The number of hours per shift.
   5. List the major construction equipment to be used on the site, describing how each piece relates to and will be used in support of the submitted Cost Loaded CPM Schedule diagram work activities/events.
   6. Provide a typed, doubled spaced, description, at least one page in length, of the plan and your approach to constructing the project.

C. To the extent that the schedule or any revised schedule shows anything not jointly agreed upon, it shall not be deemed to have been approved by the Contracting Officer. Failure to include any element of work required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase regardless of the Contracting Officer's approval of the schedule.

D. Electronic Copy Requirements and CPM Activity/Event Record Specifications: Submit to the VA an electronic file(s) containing one file of the data required to produce the schedule, reflecting all the activities/events of the complete project schedule being submitted.

1.8 PAYMENT TO THE CONTRACTOR:

A. Monthly, the contractor shall submit the AIA application and certificate for payment documents G702 & G703 reflecting updated schedule activities and cost data in accordance with the provisions of the following Article, PAYMENT AND PROGRESS REPORTING, as the basis upon which progress payments will be made pursuant to Article, PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS of Section 01 00 00, GENERAL REQUIREMENTS. The Contractor is entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated computer-produced calendar-dated schedule unless, in special situations, the Contracting Officer permits an exception to this requirement. Monthly payment

requests shall include: three copies of up to five different reports (inclusive of all pages) to the contracting officer’s representative; a listing of all project schedule changes, and associated data, made at the update; and an electronic file (s) of the resulting monthly updated schedule. These must be submitted with and substantively support the contractor’s monthly application and certificate for payment request documents.

B. When the Contractor fails or refuses to furnish to the Contracting Officer the information and schedule in electronic format, which, in the sole judgment of the Contracting Officer, is necessary for processing the monthly progress payment, the Contractor shall not be deemed to have provided an estimate and supporting schedule data upon which progress payment may be made.

1.9 PAYMENT AND PROGRESS REPORTING

A. Weekly job site progress meetings shall be held on dates mutually agreed to by the Contracting Officer (or Contracting Officer's representative) and the Contractor. Contractor and the CPM consultant will be required to attend all weekly progress meetings. Presence of Subcontractors during progress meeting is optional unless required by the Contracting Officer (or Contracting Officer's representative). The Contractor shall update the project schedule and all other data required by this section shall be accurately filled in and completed prior to the weekly progress meeting. The Contractor shall provide this information to the Contracting Officer or the VA representative in completed form three work days in advance of the progress meeting. Job progress will be reviewed to verify:

1. Actual start and/or finish dates for updated/completed activities/events.
2. Remaining duration, required to complete each activity/event started, or scheduled to start, but not completed.
3. Logic, time and cost data for change orders, and supplemental agreements that are to be incorporated into the Cost Loaded CPM Schedule diagram and computer-produced schedules. Changes in activity/event sequence and duration which have been made pursuant to the provisions of following Article, ADJUSTMENT OF CONTRACT COMPLETION.
4. Percentage for completed and partially completed activities/events.
5. Logic and duration revisions required by this section of the specifications.
6. Activity/event duration and percent complete shall be updated independently.

B. The Contractor shall submit a narrative report as a part of his weekly review and update, in a form agreed upon by the Contractor and the Contracting Officer. The narrative report shall include a description of problem areas; current and anticipated delaying factors and their estimated impact on performance of other activities/events and completion dates; and an explanation of corrective action taken or proposed. This report is in addition to the daily reports pursuant to the provisions of Article, DAILY REPORT OF WORKERS AND MATERIALS in the GENERAL CONDITIONS.

C. After completion of the joint review and the Contracting Officer's approval of all entries, the contractor will generate an updated computer-produced calendar-dated schedule and supply the Contracting Officer’s representative with reports in accordance with the Article, COMPUTER PRODUCED SCHEDULES, specified.

D. After completing the weekly schedule update, the contractor’s scheduling consultant shall rerun all current period contract change(s) against the prior approved monthly project schedule. The analysis shall only include original workday durations and schedule logic agreed upon by the contractor and resident engineer for the contract change(s). When there is a disagreement on logic and/or durations, the consultant shall use the schedule logic and/or durations provided and approved by the COTR. After each rerun update, the resulting electronic project schedule data file shall be appropriately identified and submitted to the VA in accordance to the requirements listed in articles 1.4 and 1.7. This electronic submission is separate from the regular monthly project schedule update requirements and shall be submitted to the COTR within fourteen (14) calendar days of completing the regular schedule update. **Before inserting the contract changes durations, care must be taken to ensure that only the original durations will be used for the analysis, not the reported durations after progress. In addition, once the final Cost Loaded CPM Schedule diagram is approved, the contractor must recreate all manual progress payment updates on this approved Cost Loaded CPM Schedule diagram and associated reruns for contract changes in each of these update periods as outlined above for regular update periods. This will require detailed record keeping for each of the manual progress payment updates.**

E. After VA acceptance and approval of the final Cost Loaded CPM Schedule diagram, and after each monthly update, the contractor shall submit to the Contracting Officer three blue line copies of a revised complete Cost Loaded CPM Schedule diagram showing all completed and partially completed activities/events, contract changes and logic changes made on the

intervening updates or at the first update on the final diagram. The Contracting Officer may elect to have the contractor do this on a less frequent basis, but it shall be done on a quarterly basis as a minimum.

F. Following approval of the CPM schedule, the VA, the General Contractor, its approved CPM Consultant, COTR office representatives, and all subcontractors needed, as determined by the SRE, shall meet to discuss the monthly updated schedule. The main emphasis shall be to address work activities to avoid slippage of project schedule and to identify any necessary actions required to maintain project schedule during the reporting period. The Government representatives and the Contractor should conclude the meeting with a clear understanding of those work and administrative actions necessary to maintain project schedule status during the reporting period. This schedule coordination meeting will occur after each weekly project schedule update meeting utilizing the resulting schedule reports from that schedule update. If the project is behind schedule, discussions should include ways to prevent further slippage as well as ways to improve the project schedule status, when appropriate.

1.10 RESPONSIBILITY FOR COMPLETION

A. Whenever it becomes apparent from the current weekly progress review meeting or the monthly computer-produced calendar-dated schedule that phasing or contract completion dates will not be met, the Contractor shall execute some or all of the following remedial actions:

1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
3. Reschedule the work in conformance with the specification requirements.

B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the Contracting Officer for the proposed schedule changes. If such actions are approved, the CPM revisions shall be incorporated by the Contractor into the Cost Loaded CPM Schedule diagram before the next update, at no additional cost to the Government.

1.11 CHANGES TO SCHEDULE

A. Within 30 calendar days after VA acceptance and approval of any updated computer-produced schedule, the Contractor will submit a revised schedule, the associated electronic copy, and a list of any

activity/event changes including predecessors and successors for any of the following reasons:

1. Delay in completion of any activity/event or group of activities/events, indicate an extension of the project completion by 20 working days or 10 percent of the remaining project duration, whichever is less. Such delays which may be involved with contract changes, strikes, unusual weather, and other delays will not relieve the Contractor from the requirements specified unless the conditions are shown on the CPM as the direct cause for delaying the project beyond the acceptable limits.
2. Delays in submittals, or deliveries, or work stoppage are encountered which make rescheduling of the work necessary.
3. The schedule does not represent the actual prosecution and progress of the project.
4. When there is, or has been, a substantial revision to the activity/event costs of the Cost Loaded CPM Schedule diagram regardless of the cause for these revisions.

B. CPM revisions made under this paragraph which affect the previously approved computer-produced schedules for Government furnished equipment, vacating of areas by the VA Medical Center, contract phase(s) and sub phase(s), utilities furnished by the Government to the Contractor, or any other previously contracted item, must be furnished in writing to the Contracting Officer for approval.

C. Contracting Officer's approval for the revised Cost Loaded CPM Schedule diagram and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.

D. The cost of revisions to the schedule resulting from contract changes will be included in the proposal for changes in work as specified in Article, CHANGES of the Section 01 00 00 GENERAL REQUIREMENTS, and will be based on the complexity of the revision or contract change, man hours expended in analyzing the change, and the total cost of the change.

E. The cost of revisions to the Cost Loaded CPM Schedule diagram not resulting from contract changes is the responsibility of the Contractor.

1.12 ADJUSTMENT OF CONTRACT COMPLETION

A. The contract completion time will be adjusted only for causes specified in this contract. Request for an extension of the contract completion date by the Contractor shall be supported with a justification, CPM data and supporting evidence as the Contracting Officer may deem necessary for determination as to whether or not the Contractor is entitled to an

extension of time under the provisions of the contract. Submission of proof based on revised activity/event logic, durations (in work days) and costs is obligatory to any approvals. The schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time period in question and all other relevant information.

B. Actual delays in activities/events which, according to the computer-produced calendar-dated schedule, do not affect the extended and predicted contract completion dates shown by the critical path in the Cost Loaded CPM Schedule, will not be the basis for a change to the contract completion date. The Contracting Officer will within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Contracting Officer's decision.

C. The Contractor shall submit each request for a change in the contract completion date to the Contracting Officer in accordance with the provisions specified under Article, CHANGES, in the Section 01 00 00, GENERAL REQUIREMENTS. The Contractor shall include, as a part of each change order proposal, a sketch showing all CPM logic revisions, duration (in work days) changes, and cost changes, for work in question and its relationship to other activities on the approved Cost Loaded CPM Schedule diagram.

D. All delays due to non-work activities/events such as RFI’s, WEATHER, STRIKES, and similar non-work activities/events shall be analyzed on a month by month basis.

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SECTION 01 33 23
SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1-1. Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL REQUIREMENTS.

1-2. For the purposes of this contract, samples (including laboratory samples to be tested), test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all items collectively as SUBMITTALS.

1-3. Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:

A. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;
B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.

1-4. SUBMITTAL REGISTER: The Contractor shall prepare a Submittal Register and submit all items specified in other sections of these specifications on that Submittal Register. Submit (two (2) hard copies plus associated electronic file) to the Contracting Officer for approval within 10 calendar days after Notice to Proceed. The Contractor shall keep this electronic file up-to-date and shall submit it to the Government together with the monthly payment request. The approved Submittal Register will become the scheduling document and will be used to control submittals throughout the life of the contract. The Submittal Register and the progress schedules shall be coordinated. At a minimum the Submittal Register will include the following information for each submittal:

1. Specification section
2. Description of submittal
3. Date submittal will be issued for review/approval
4. Date submittal to be returned to contractor

1-5. SCHEDULING: Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and

submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time) shall be allowed and shown on the Submittal Register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals. The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1-6. Submittals will be reviewed for compliance with contract requirements by Architect-Engineer, and action thereon will be taken by Resident Engineer on behalf of the Contracting Officer.

1-7. Upon receipt of submittals, Architect-Engineer will assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.

1-8. The Government reserves the right to require additional submittals, whether or not particularly mentioned in this contract. If additional submittals beyond those required by the contract are furnished pursuant to request therefor by Contracting Officer, adjustment in contract price and time will be made in accordance with Articles titled CHANGES (FAR 52.243-4) and CHANGES - SUPPLEMENT (VAAR 852.236-88) of the GENERAL REQUIREMENTS.

1-9. Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs and Architect-Engineer. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and Architect- Engineer assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.

1-10. Submittals must be submitted by Contractor only and shipped prepaid. Contracting Officer assumes no responsibility for checking quantities or exact numbers included in such submittals.

A. Submit samples required by Division Sections 09, in quadruplicate. Submit other samples in single units unless otherwise specified. Submit shop drawings, schedules, manufacturers' literature and data, and certificates in quadruplicate, except where a greater number is specified.

B. Submittals will receive consideration only when covered by a transmittal letter signed by Contractor. Letter shall be sent via first class mail and shall contain the list of items, name of Medical Center, name of Contractor, contract number, applicable specification paragraph numbers,

applicable drawing numbers (and other information required for exact identification of location for each item), manufacturer and brand, ASTM or Federal Specification Number (if any) and such additional information as may be required by specifications for particular item being furnished. In addition, catalogs shall be marked to indicate specific items submitted for approval.

1. A copy of letter must be enclosed with items, and any items received without identification letter will be considered "unclaimed goods" and held for a limited time only.
2. Each sample, certificate, manufacturers' literature and data shall be labeled to indicate the name and location of the Medical Center, name of Contractor, manufacturer, brand, contract number and ASTM or Federal Specification Number as applicable and location(s) on project.
3. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.

C. In addition to complying with the applicable requirements specified in preceding Article 1.10, samples which are required to have Laboratory Tests (those preceded by symbol "LT" under the separate sections of the specification shall be tested, at the expense of Contractor, in a commercial laboratory approved by Contracting Officer.

1. Laboratory shall furnish Contracting Officer with a certificate stating that it is fully equipped and qualified to perform intended work, is fully acquainted with specification requirements and intended use of materials and is an independent establishment in no way connected with organization of Contractor or with manufacturer or supplier of materials to be tested.
2. Certificates shall also set forth a list of comparable projects upon which laboratory has performed similar functions during past five years.
3. Samples and laboratory tests shall be sent directly to approved commercial testing laboratory.
4. Contractor shall send a copy of transmittal letter to both Resident Engineer and to Architect-Engineer simultaneously with submission of material to a commercial testing laboratory.
5. Laboratory test reports shall be sent directly to Resident Engineer for appropriate action.
6. Laboratory reports shall list contract specification test requirements and a comparative list of the laboratory test results. When tests show that the material meets specification requirements, the laboratory shall so certify on test report.

7. Laboratory test reports shall also include a recommendation for approval or disapproval of tested item.

D. If submittal samples have been disapproved, resubmit new samples as soon as possible after notification of disapproval. Such new samples shall be marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.

E. Approved samples will be kept on file by the Resident Engineer at the site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Such request should be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.

F. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check.

1. Submit electronic drawings and product data in lieu of paper copies. Electronic submittals shall be submitted to the COTR in PDF format along with an executable transmittal file. Submittals shall be printed out, marked up, processed, and returned electronically to the Contractor’s Project Manager.
2. Each drawing shall have marked thereon, proper descriptive title, including Medical Center location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
3. A space 120 mm by 125 mm (4-3/4 by 5 inches) shall be reserved on each drawing to accommodate approval or disapproval stamp.
4. When work is directly related and involves more than one trade, shop drawings shall be submitted to Architect-Engineer under one cover.

1-11. Samples (except laboratory samples), shop drawings, test reports, certificates and manufacturers' literature and data, shall be submitted for approval to

Makovich & Pusti Architects, Inc.

111 Front Street

Berea, Ohio 44017

1-12. At the time of transmittal to the Architect-Engineer, the Contractor shall also send a copy of the complete submittal directly to the Contracting Officer's Technical Representative (COTR).

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SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies the availability and source of references and standards specified in the project manual under paragraphs APPLICABLE PUBLICATIONS and/or shown on the drawings.

1.2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS FPMR PART 101-29 (FAR 52.211-1) (AUG 1998)

A. The GSA Index of Federal Specifications, Standards and Commercial Item Descriptions, FPMR Part 101-29 and copies of specifications, standards, and commercial item descriptions cited in the solicitation may be obtained for a fee by submitting a request to – GSA Federal Supply Service, Specifications Section, Suite 8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Telephone (202) 619-8925, Facsimile (202) 619-8978.

B. If the General Services Administration, Department of Agriculture, or Department of Veterans Affairs issued this solicitation, a single copy of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained free of charge by submitting a request to the addressee in paragraph (a) of this provision. Additional copies will be issued for a fee.

1.3 AVAILABILITY FOR EXAMINATION OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-4) (JUN 1988)

The specifications and standards cited in this solicitation can be examined at the following location:

DEPARMENT OF VETERANS AFFAIRS
Office of Construction & Facilities Management
Facilities Quality Service (00CFM1A)
811 Vermont Avenue, NW - Room 462
Washington, DC 20420
Telephone Numbers: (202) 461-8217 or (202) 461-8292
Between 9:00 AM - 3:00 PM

1.4 AVAILABILITY OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-3) (JUN 1988)

The specifications cited in this solicitation may be obtained from the associations or organizations listed below.

AA Aluminum Association Inc.
http://www.aluminum.org

AABC Associated Air Balance Council
http://www.aabchq.com

AAMA American Architectural Manufacturer's Association
http://www.aamanet.org

AASHTO American Association of State Highway and Transportation Officials
http://www.aashto.org

ACGIH American Conference of Governmental Industrial Hygienists
http://www.acgih.org

ADC Air Diffusion Council
http://flexibleduct.org

AGA American Gas Association
http://www.aga.org

AGC Associated General Contractors of America
http://www.agc.org

AGMA American Gear Manufacturers Association, Inc.
http://www.agma.org

AISC American Institute of Steel Construction
http://www.aisc.org

AISI American Iron and Steel Institute
http://www.steel.org

AMCA Air Movement and Control Association, Inc.
http://www.amca.org

ANSI American National Standards Institute, Inc.
http://www.ansi.org

APA The Engineered Wood Association
http://www.apawood.org

ARI Air-Conditioning and Refrigeration Institute
http://www.ari.org

ASAE American Society of Agricultural Engineers
http://www.asae.org

ASCE American Society of Civil Engineers
http://www.asce.org

ASHRAE American Society of Heating, Refrigerating, and Air-Conditioning Engineers
http://www.ashrae.org

ASME American Society of Mechanical Engineers
http://www.asme.org

ASSE American Society of Sanitary Engineering
http://www.asse-plumbing.org

ASTM American Society for Testing and Materials
http://www.astm.org

AWI Architectural Woodwork Institute
http://www.awinet.org

AWS American Welding Society
http://www.aws.org

AWWA American Water Works Association
http://www.awwa.org

BHMA Builders Hardware Manufacturers Association
http://www.buildershardware.com

BIA Brick Institute of America
http://www.bia.org

CAGI Compressed Air and Gas Institute
http://www.cagi.org

CGA Compressed Gas Association, Inc.
http://www.cganet.com

CISCA Ceilings and Interior Systems Construction Association
http://www.cisca.org

CISPI Cast Iron Soil Pipe Institute
http://www.cispi.org

CRSI Concrete Reinforcing Steel Institute
http://www.crsi.org

CTI Cooling Technology Institute
http://www.cti.org

DHI Door and Hardware Institute
http://www.dhi.org

EGSA Electrical Generating Systems Association
http://www.egsa.org

EEI Edison Electric Institute
http://www.eei.org

EPA Environmental Protection Agency
http://www.epa.gov

ETL ETL Testing Laboratories, Inc.
http://www.et1.com

FCC Federal Communications Commission
http://www.fcc.gov

FPS The Forest Products Society
http://www.forestprod.org

GANA Glass Association of North America
http://www.cssinfo.com/info/gana.html/

FM Factory Mutual Insurance
http://www.fmglobal.com

GA Gypsum Association
http://www.gypsum.org

GSA General Services Administration
http://www.gsa.gov

HI Hydraulic Institute
http://www.pumps.org

HPVA	Hardwood Plywood & Veneer Association http://www.hpva.org
ICBO	International Conference of Building Officials http://www.icbo.org
ICEA	Insulated Cable Engineers Association Inc. http://www.icea.net
\ICAC	Institute of Clean Air Companies http://www.icac.com
IEEE	Institute of Electrical and Electronics Engineers http://www.ieee.org\
IPCEA	Insulated Power Cable Engineers Association
NBMA	Metal Buildings Manufacturers Association http://www.mbma.com
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry Inc. http://www.mss-hq.com
NAAMM	National Association of Architectural Metal Manufacturers http://www.naamm.org
NAPHCC	Plumbing-Heating-Cooling Contractors Association http://www.phccweb.org.org
NBS	National Bureau of Standards See - NIST
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors http://www.nationboard.org
NEC	National Electric Code See - NFPA National Fire Protection Association
NEMA	National Electrical Manufacturers Association http://www.nema.org
NFPA	National Fire Protection Association http://www.nfpa.org
NHLA	National Hardwood Lumber Association http://www.natlhardwood.org

NIH National Institute of Health
http://www.nih.gov

NIST National Institute of Standards and Technology
http://www.nist.gov

NLMA Northeastern Lumber Manufacturers Association, Inc.
http://www.nelma.org

NPA National Particleboard Association
18928 Premiere Court
Gaithersburg, MD 20879
(301) 670-0604

NSF National Sanitation Foundation
http://www.nsf.org

NWWDA Window and Door Manufacturers Association
http://www.nwwda.org

OSHA Occupational Safety and Health Administration
Department of Labor
http://www.osha.gov

PCA Portland Cement Association
http://www.portcement.org

PPI The Plastic Pipe Institute
http://www.plasticpipe.org

PEI Porcelain Enamel Institute, Inc.
http://www.porcelainenamel.com

RFCI The Resilient Floor Covering Institute
http://www.rfci.com

RMA Rubber Manufacturers Association, Inc.
http://www.rma.org

SDI Steel Door Institute
http://www.steeldoor.org

SMACNA Sheet Metal and Air-Conditioning Contractors
National Association, Inc.
http://www.smacna.org

SSPC The Society for Protective Coatings
http://www.sspc.org

TCA Tile Council of America, Inc.
http://www.tileusa.com

TEMA Tubular Exchange Manufacturers Association
http://www.tema.org

UBC The Uniform Building Code
See ICBO

UL Underwriters' Laboratories Incorporated
http://www.ul.com

ULC Underwriters' Laboratories of Canada
http://www.ulc.ca

WCLIB West Coast Lumber Inspection Bureau
6980 SW Varns Road, P.O. Box 23145
Portland, OR 97223
(503) 639-0651

WWPA Western Wood Products Association
http://www.wwpa.org

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SECTION 01 45 29
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies materials testing activities and inspection services required during project construction to be provided by a Testing Laboratory retained as paid for by Contractor.

1.2 APPLICABLE PUBLICATIONS:

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

A325-06.....Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

A370-07.....Definitions for Mechanical Testing of Steel Products

A416/A416M-06.....Steel Strand, Uncoated Seven-Wire for Prestressed Concrete

A490-06.....Heat Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength

C109/C109M-05.....Compressive Strength of Hydraulic Cement Mortars

C140-07.....Sampling and Testing Concrete Masonry Units and Related Units

C780-07.....Pre-construction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry

C1019-08.....Sampling and Testing Grout

C1064/C1064M-05.....Freshly Mixed Portland Cement Concrete

C1077-06.....Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation

C1314-07.....Compressive Strength of Masonry Prisms

E94-04.....Radiographic Testing

E164-03.....Ultrasonic Contact Examination of Weldments

E329-07.....Agencies Engaged in Construction Inspection and/or Testing

E543-06.....Agencies Performing Non-Destructive Testing

E605-93(R2006).....Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members

E709-(2001).....Guide for Magnetic Particle Examination

E1155-96(R2008).....Determining FF Floor Flatness and FL Floor Levelness Numbers

C. American Welding Society (AWS):

D1.1-07.....Structural Welding Code-Steel

1.3 REQUIREMENTS:

A. Accreditation Requirements: Testing Laboratory retained by Department of Veterans Affairs, must be accredited by one or more of the National Voluntary Laboratory Accreditation Program (NVLAP) programs acceptable in the geographic region for the project. Furnish to the Contracting Officer and Resident Engineer a copy of the Certificate of Accreditation and Scope of Accreditation. For testing laboratories that have not yet obtained accreditation by a NVLAP program, submit an acknowledgement letter from one of the laboratory accreditation authorities indicating that the application for accreditation has been received and the accreditation process has started, and submit to the Contracting Officer and Resident Engineer for approval, certified statements, signed by an official of the testing laboratory attesting that the proposed laboratory, meets or conforms to the ASTM standards listed below as appropriate to the testing field.

1. Laboratories engaged in testing of construction materials shall meet the requirements of ASTM E329.
2. Laboratories engaged in inspection and testing of steel, and related alloys will be evaluated according to ASTM A880.
3. Laboratories engaged in non-destructive testing (NDT) shall meet the requirements of ASTM E543.
4. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA.

B. Inspection and Testing: Testing laboratory shall inspect materials and workmanship and perform tests described herein and additional tests requested by Resident Engineer. When it appears materials furnished, or work performed by Contractor fail to meet construction contract requirements, Testing Laboratory shall direct attention of Resident Engineer to such failure.

C. Written Reports: Testing laboratory shall submit test reports to Resident Engineer, Contractor, and Local Building Authority within 24 hours after each test is completed unless other arrangements are agreed to in writing by the Resident Engineer. Submit reports of tests that fail to meet construction contract requirements on colored paper.

D. Verbal Reports: Give verbal notification to Resident Engineer immediately of any irregularity.

E. Test Standards: The Testing Laboratory shall include a photocopy of published standards (ASTM, AASHTO, ACI, ANSI, AWS, ASHRAE, UL, etc.) referred to or specifically referenced which are pertinent to any Sections of these specifications. Furnish one set of standards in single copies or bound volumes to the Architect/Engineer within 60 days.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 MASONRY:

A. Mortar Tests:
   1. Laboratory compressive strength test:
      a. Comply with ASTM C780.
      b. Obtain samples during or immediately after discharge from batch mixer.
      c. Furnish molds with 50 mm (2 inch), 3 compartment gang cube.
      d. Test one sample at 7 days and 2 samples at 28 days.
   2. Two tests during first week of operation; one test per week after initial test until masonry completion.

B. Grout Tests:
   1. Laboratory compressive strength test:
      a. Comply with ASTM C1019.
      b. Test one sample at 7 days and 2 samples at 28 days.
      c. Perform test for each 230 m^2 (2500 square feet) of masonry.

C. Masonry Unit Tests:
   1. Laboratory Compressive Strength Test:
      a. Comply with ASTM C140.
      b. Test 3 samples for each 460 m^2 (5000 square feet) of wall area.

D. Prism Tests: For each type of wall construction indicated, test masonry prisms per ASTM C1314 for each 460 m^2 (5000 square feet) of wall area. Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.

3.2 STRUCTURAL STEEL:

A. General: Provide shop and field inspection and testing services to certify structural steel work is done in accordance with contract documents. Welding shall conform to AWS D1.1 Structural Welding Code.

B. Prefabrication Inspection:
   1. Review design and shop detail drawings for size, length, type and location of all welds to be made.

2. Approve welding procedure qualifications either by pre-qualification or by witnessing qualifications tests.
3. Approve welder qualifications by certification or retesting.
4. Approve procedure for control of distortion and shrinkage stresses.
5. Approve procedures for welding in accordance with applicable sections of AWS D1.1.

C. Fabrication and Erection:
1. Weld Inspection:
   a. Inspect welding equipment for capacity, maintenance and working condition.
   b. Verify specified electrodes and handling and storage of electrodes in accordance with AWS D1.1.
   c. Inspect preparation and assembly of materials to be welded for conformance with AWS D1.1.
   d. Inspect preheating and interpass temperatures for conformance with AWS D1.1.
   e. Measure 25 percent of fillet welds.
   f. Welding Magnetic Particle Testing: Test in accordance with ASTM E709 for a minimum of:
      1) 20 percent of all shear plate fillet welds at random, final pass only.
      2) 20 percent of all continuity plate and bracing gusset plate fillet welds, at random, final pass only.
      3) 100 percent of tension member fillet welds (i.e., hanger connection plates and other similar connections) for root and final passes.
      4) 20 percent of length of built-up column member partial penetration and fillet welds at random for root and final passes.
      5) 100 percent of length of built-up girder member partial penetration and fillet welds for root and final passes.
   g. Welding Ultrasonic Testing: Test in accordance with ASTM E164 and AWS D1.1 for 100 percent of all full penetration welds, braced and moment frame column splices, and a minimum of 20 percent of all other partial penetration column splices, at random.
   h. Verify that correction of rejected welds are made in accordance with AWS D1.1.
   i. Testing and inspection do not relieve the Contractor of the responsibility for providing materials and fabrication procedures in compliance with the specified requirements.
2. Bolt Inspection:

a. Inspect high-strength bolted connections in accordance AISC Specifications for Structural Joints Using ASTM A325 or A490 Bolts.
b. Slip-Critical Connections: Inspect 10 percent of bolts, but not less than 2 bolts, selected at random in each connection in accordance with AISC Specifications for Structural Joints Using ASTM A325 or A490 Bolts. Inspect all bolts in connection when one or more are rejected.
c. Fully Pre-tensioned Connections: Inspect 10 percent of bolts, but not less than 2 bolts, selected at random in 25 percent of connections in accordance with AISC Specification for Structural Joints Using ASTM A325 or A490 Bolts. Inspect all bolts in connection when one or more are rejected.
d. Bolts installed by turn-of-nut tightening may be inspected with calibrated wrench when visual inspection was not performed during tightening.
e. Snug Tight Connections: Inspect 10 percent of connections verifying that plies of connected elements have been brought into snug contact.
f. Inspect field erected assemblies; verify locations of structural steel for plumbness, level, and alignment.

D. Submit inspection reports, record of welders and their certification, and identification, and instances of noncompliance to Resident Engineer.

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SECTION 01 57 19
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies the control of environmental pollution and damage that the Contractor must consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.

B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:
   1. Adversely effect human health or welfare,
   2. Unfavorably alter ecological balances of importance to human life,
   3. Effect other species of importance to humankind, or;
   4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.

C. Definitions of Pollutants:
   1. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
   2. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
   3. Sediment: Soil and other debris that has been eroded and transported by runoff water.
   4. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.
   5. Surface Discharge: The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "water of the United States" and would require a permit to discharge water from the governing agency.
   6. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.

7. Sanitary Wastes:
   a. Sewage: Domestic sanitary sewage and human and animal waste.
   b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2 QUALITY CONTROL

A. Establish and maintain quality control for the environmental protection of all items set forth herein.

B. Record on daily reports any problems in complying with laws, regulations, and ordinances. Note any corrective action taken.

1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

B. U.S. National Archives and Records Administration (NARA):
33 CFR 328.....Definitions

1.4 SUBMITTALS

A. In accordance with Section, 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:

1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the Resident Engineer to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than 20 days after the meeting, the Contractor shall prepare and submit to the Contracting Officer’s Technical Representative (COTR) for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:
   a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.
   b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.
   c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
   d. Description of the Contractor's environmental protection personnel training program.
   e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the Contractor's

proposed operations and the requirements imposed by those laws, regulations, and permits.

f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.

g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.

h. Permits, licenses, and the location of the solid waste disposal area.

i. Drawings showing locations of any proposed material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Erosion Control Plan approved by the District Office of the U.S. Soil Conservation Service and the Department of Veterans Affairs.

j. Environmental Monitoring Plans for the job site including land, water, air, and noise.

k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.

B. Approval of the Contractor's Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

1.5 PROTECTION OF ENVIRONMENTAL RESOURCES

A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.

B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the Resident Engineer. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted.

1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence

isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.

2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.
   a. Box and protect from damage existing trees and shrubs to remain on the construction site.
   b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
   c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
3. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements.
4. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.
5. Handle discarded materials other than those included in the solid waste category as directed by the Resident Engineer.

C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.
   1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
   2. Monitor water areas affected by construction.

D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning construction operations, list species that require specific attention along with measures for their protection.

E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Ohio and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.

1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.
2. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.
3. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.

F. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the COTR. Maintain noise-produced work at or below the decibel levels and within the time periods specified.

1. Perform construction activities involving repetitive, high-level impact noise only between 8:00 a.m. and 6:00 p.m unless otherwise permitted by local ordinance or the Resident Engineer. Repetitive impact noise on the property shall not exceed the following dB limitations:

Time Duration of Impact Noise	Sound Level in dB
More than 12 minutes in any hour	70
Less than 30 seconds of any hour	85
Less than three minutes of any hour	80
Less than 12 minutes of any hour	75

2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, but not limited to, the following:
   a. Maintain maximum permissible construction equipment noise levels at 15 m (50 feet) (dBA):

MATERIALS HANDLING	
PNEUMATIC TOOLS	80
SAWS	75

   b. Use shields or other physical barriers to restrict noise transmission.

c. Provide soundproof housings or enclosures for noise-producing machinery.

d. Use efficient silencers on equipment air intakes.

e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.

f. Line hoppers and storage bins with sound deadening material.

g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.

3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure at the property line or 15 m (50 feet) from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. To minimize the effect of reflective sound waves at buildings, take measurements at 900 to 1800 mm (three to six feet) in front of any building face. Submit the recorded information to the COTR noting any problems and the alternatives for mitigating actions.

G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.

H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the Resident Engineer. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

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SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.

B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.

C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:

1. Waste Management Plan development and implementation.
2. Techniques to minimize waste generation.
3. Sorting and separating of waste materials.
4. Salvage of existing materials and items for reuse or resale.
5. Recycling of materials that cannot be reused or sold.

D. At a minimum the following waste categories shall be diverted from landfills:

1. Soil.
2. Inerts (eg, concrete, masonry and asphalt).
3. Clean dimensional wood and palette wood.
4. Green waste (biodegradable landscaping materials).
5. Engineered wood products (plywood, particle board and I-joists, etc).
6. Metal products (eg, steel, wire, beverage containers, etc).
7. Cardboard, paper and packaging.
8. Bitumen roofing materials.
9. Plastics (eg, ABS, PVC).
10. Carpet and/or pad.
11. Gypsum board.
12. Insulation.
13. Paint.

1.2 RELATED WORK

A. Section 02 41 00, DEMOLITION.

B. Section 01 00 00, GENERAL REQUIREMENTS.

1.3 QUALITY ASSURANCE

A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction /Demolition waste includes products of the following:
   1. Excess or unusable construction materials.
   2. Packaging used for construction products.
   3. Poor planning and/or layout.
   4. Construction error.
   5. Over ordering.
   6. Weather damage.
   7. Contamination.
   8. Mishandling.
   9. Breakage.

B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.

C. Contractor shall develop and implement procedures to reuse and recycle new materials to a minimum of 50 percent.

D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.

E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website http://www.wbdg.org provides a Construction Waste Management Database that contains information on companies that haul. Collect, and process recyclable debris from construction projects.

F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.

G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.

H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

1.4 TERMINOLOGY

A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.

B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.

C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.

D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.

E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).

F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.

G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.

H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.

I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.

J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.

K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in

the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.

M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.

N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.

O. Return: To give back reusable items or unused products to vendors for credit.

P. Salvage: To remove waste materials from the site for resale or re-use by a third party.

Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.

R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.

S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

1.5 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:

B. Prepare and submit to the Contracting Officer's Technical Representative (COTR) a written demolition debris management plan. The plan shall include, but not be limited to, the following information:

1. Procedures to be used for debris management.
2. Techniques to be used to minimize waste generation.
3. Analysis of the estimated job site waste to be generated:
   a. List of each material and quantity to be salvaged, reused, recycled.

b. List of each material and quantity proposed to be taken to a landfill.

4. Detailed description of the Means/Methods to be used for material handling.
   a. On site: Material separation, storage, protection where applicable.
   b. Off site: Transportation means and destination. Include list of materials.
      1) Description of materials to be site-separated and self-hauled to designated facilities.
      2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
   c. The names and locations of mixed debris reuse and recycling facilities or sites.
   d. The names and locations of trash disposal landfill facilities or sites.
   e. Documentation that the facilities or sites are approved to receive the materials.

B. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.

C. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling. Contractor shall submit receipts for landfill and recycling locations.

1.6 APPLICABLE PUBLICATIONS

Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.

A. U.S. Green Building Council (USGBC):
LEED Green Building Rating System for New Construction

1.7 RECORDS

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Records shall be kept in accordance with the LEED Reference Guide and LEED Template.

PART 2 - PRODUCTS

2.1 MATERIALS

A. List of each material and quantity to be salvaged, recycled, reused.

B. List of each material and quantity proposed to be taken to a landfill.

C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

PART 3 - EXECUTION

3.1 COLLECTION

A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.

B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.

C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

3.2 DISPOSAL

A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.

B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

3.3 REPORT

A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.

B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.

C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

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SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Inspection procedures.
   2. Project Record Documents.
   3. Operation and maintenance manuals.
   4. Warranties.
   5. Instruction of Owner's personnel.
   6. Final cleaning.

B. Related Sections include the following:
   1. All Divisions

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   2. Advise COR of pending insurance changeover requirements.
   3. Submit specific warranties, guarantees, maintenance service agreements, as-built drawings and documents, final certifications, and similar documents.
   4. Obtain and submit releases permitting COR unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   5. Prepare and submit Project Record Documents, operation and maintenance manuals, property surveys (as needed), and similar final record information.
   6. Make final changeover of permanent locks and deliver keys to COR. Advise COR's personnel of changeover in security provisions (if necessary).
   7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   8. Submit changeover information related to COR's occupancy, use, operation, and maintenance.
   9. Complete final cleaning requirements, including touchup painting.
   10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/Engineer will prepare a punch list letter after inspection of items that must be completed or corrected before the retainage can be billed.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   1. Submit certified copy of Architect/Engineer's punch list letter of items to be completed or corrected (punch list), endorsed and dated by Architect/Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   3. Instruct COR's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/Engineer will prepare a final letter after inspection or will notify Contractor of construction that must be completed or corrected before the retainage can be billed.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

C. Submit a final Application for Payment according to Division 1 Section "Payment Procedures" after the final inspection.

1.5 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect/Engineer’s reference during normal working hours.

B. Record Drawings: Maintain and submit one set of black-line white prints of Contract Drawings and Shop Drawings.
   1. Mark Record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
      a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
      b. Accurately record information in an understandable drawing technique.

c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Mark important additional information that was either shown schematically or omitted from original Drawings.
4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. Record Specifications: Submit 1 copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders, Record Drawings, where applicable.

D. Record Product Data: Submit one copy of each Product Data submittal. Mark 1 set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Drawings, and Record Specifications, where applicable.

E. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.6 OPERATION AND MAINTENANCE MANUALS

A. Assemble four complete sets of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
1. Operation Data:
a. Emergency instructions and procedures.
b. Operating procedures, including seasonal operations.

2. Maintenance Data:
   a. Manufacturer's information, including list of spare parts.
   b. Name, address, and telephone number of Installer or supplier.
   c. Maintenance procedures.
   d. Maintenance and service schedules for preventive and routine maintenance.
   e. Maintenance record forms.
   f. Sources of maintenance materials.
   g. Copies of maintenance service agreements.
   h. Copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.7 WARRANTIES/GUARANTEES

A. Submittal Time: Submit written warranties on request of Architect/Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Warranty Requirements:

1. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
2. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty.
3. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the COR has benefited from use of the Work through a portion of its anticipated useful service life.
4. COR's Recourse: Expressed warranties made to the COR are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the COR can enforce such other duties, obligations, rights, or remedies.
5. Rejection of Warranties: The COR reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

C. Guarantee Requirements:
1. All Work performed under the Contract for this Project shall be covered by a 5-year Contractor Guarantee.
2. Guarantee shall be submitted on the included form.

D. Partial Occupancy: Submit properly executed warranties with the final application for payment.

E. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
   1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.
   2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
   3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES/GUARANTEES”, Project name, and name of Contractor.

F. Provide three copies of the “Warranty/Guarantee” binders.

G. LIST OF WARRANTIES/GUARANTEES

   1. Schedule: Provide warranties on products and installations as specified in the following Sections:

      i. Section 04 01 20 Maintenance of Unit Masonry

         A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

      ii. Section 04 05 13 Masonry Mortaring

         A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

      iii. Section 04 20 00 Unit Masonry

         A. Warrant exterior masonry walls against moisture leaks and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be five years.

         B. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

iv. Section 05 50 00 Fabrications Metal

A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

v. Section 06 10 00 Rough Carpentry

A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

B. Standard written warranty of chemical treatment manufacturer for the performance of each type of treatment.

vi. Section 07 19 00 Water Repellents

A. General Warranty: Submit a written warranty, executed by the applicator and water repellent manufacturer, covering materials and labor, agreeing to repair or replace materials that fail to provide water repellence within the specified warranty period.
   1. Loss of water repellency:
      a. Brick Masonry: 1.0 mil/20 minutes or greater (80 mph wind driven rain equivalent).
   2. Warranty Period: Ten (10) years from date of Project Closeout.

B. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

vii. Section 07 13 30 Fully Adhered EIP

A. Manufacturer's Warranty: The Contractor shall obtain the Membrane manufacturer’s written warranty covering the entire roofing system for 20-years and from wind damage for up to 90-mph winds, including removal and replacement without charge to the Owner. The Contractor shall also obtain the roofing manufacturer’s 20-year written warranty, agreeing to repair or replace roofing that does not comply with requirements and/or that does not remain watertight within specified warranty period.
   1. Warranty Period: 20 years after date of Substantial Completion.
   2. A wind guaranty up to 90-mph.

B. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and/or faulty workmanship and/or materials. Guaranty shall include removal and replacement of all overburden when repairing any leaks without cost to the Owner. All costs for any warranties and guaranties in paragraphs A and

B shall be paid by the Contractor and material manufacturer.

viii. Section 07 13 36 EIP Composite PRMA

A. Manufacturer's Warranty: The Contractor shall obtain the Composite PRMA manufacturer’s written warranty covering the entire roofing system for 20-years and from wind damage for up to 80-mph winds, including overburden removal and replacement without charge to the Owner. The Contractor shall also obtain the waterproofing manufacturer’s 20-year written warranty, agreeing to repair or replace waterproofing that does not comply with requirements and/or that does not remain watertight within specified warranty period, with the provision for removal and replacement of all overburden to repair leaks and/or problems with the installed roof system.
1. Warranty Period: 20 years after date of Substantial Completion.
2. Composite PRMA manufacturer’s warranty shall include removal and replacement of all overburden when repairing any leaks without cost to Owner.
3. A wind guaranty up to 80-mph.

B. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and/or faulty workmanship and/or materials. Guaranty shall include removal and replacement of all overburden when repairing any leaks without cost to the Owner. All costs for any warranties and guaranties shall be paid by the Contractor and material manufacturer.

ix. Section 07 41 20 Preformed Manufactured Wall Panels

A. General Warranty: Special warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

A. Special Finish Warranty: Submit a written warranty, signed by manufacturer, covering failure of the factory-applied exterior finish on metal wall panels within the specified warranty period and agreeing to repair finish or replace wall panels that show evidence of finish deterioration. Deterioration of finish includes, but is not limited to, color fade, chalking, cracking, peeling, and loss of film integrity.

B. Finish Warranty Period: 20 years from date of Substantial Completion.

D. The Contractor shall furnish a written five (5) year Guarantee covering labor and materials used in the installation against leaks and faulty workmanship or mate-

rials. All costs for any of the above shall be absorbed by the siding contractor and material manufacturer.

x. Section 07 62 00 Sheet Metal Flashing and Trim

A. The Contractor shall submit a 20-year written Warranty, without monetary limitation, signed by the aluminum manufacturer, guaranteeing the finish will not chalk, change color more than 5 NBS units, crack, check or peel.

B. Wind Rated Manufacturer Warranty: Warranted materials shall be free of defects in material and workmanship for five years after shipment. If, after inspection, the manufacturer agrees that materials are defective, the manufacturer shall, at their option, repair or replace them.
1. Wind Rated Manufacturer Wind Warranty:
a. Lifetime, 215 M.P.H. wind warranty

C. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

xi. Section 07 72 00 Roof Accessories

A. The Contractor shall furnish a written five- (5) year Guaranty covering labor and materials used in the repairs/replacement against leaks and/or faulty workmanship or materials. All costs for any of the above shall be absorbed by the roofing contractor and material manufacturer.

xii. Section 07 92 00 Joint Sealants

A. Submit signed copies of the following warranties against adhesive and cohesive failure of sealant and against infiltration of water and air through sealed joint for period of 3 years from date of completion.
1. Manufacturer's standard warranty covering sealant materials.
2. Manufacturer’s 20-year non-stain warranty.

B. The Contractor shall furnish a written five- (5) year Guaranty covering labor and materials used in the repairs/replacement against leaks and/or faulty workmanship or materials. All costs for any of the above shall be absorbed by the roofing contractor and material manufacturer.

xiii. Section 08 43 00 Aluminum Storefront

A. Storefront: Ten (10) years from Date of Substantial Completion.

B. Dual-seal insulating glass units: warrant seal for ten

years against visual obstruction from film formation or moisture collection between internal glass surfaces, excluding that caused by glass breakage or abuse.

C. The Contractor shall furnish a written five- (5) year Guaranty covering labor and materials used in the repairs/replacement against leaks and/or faulty workmanship or materials. All costs for any of the above shall be absorbed by the roofing contractor and material manufacturer.

D. The Contractor shall submit a 10-year written Warranty, without monetary limitation, signed by the aluminum manufacturer, guaranteeing the finish. This warranty shall include the finish on the insulated blank panels.

E. All warranties and guarantees must be submitted and approved by the owner before retainage will be released.

xiv. Section 08 80 00 Glazing

A. Warranty: Conform to terms of "Warranty of Construction", FAR clause 52.246-21, except extend warranty period for the following:

1. Bullet resistive plastic material to remain visibly clear without discoloration for 10 years.

2. Insulating glass units to remain sealed for 10 years.

xv. Section 09 90 00 Exterior Painting

A. The Contractor shall furnish a written five- (5) year Guaranty covering labor and materials used in the repairs/replacement against leaks and/or faulty workmanship or materials. All costs for any of the above shall be absorbed by the roofing contractor and material manufacturer.

xvi. Section 09 91 00 Interior Painting

A. The Contractor shall furnish a written five- (5) year Guaranty covering labor and materials used in the repairs/replacement against leaks and/or faulty workmanship or materials. All costs for any of the above shall be absorbed by the roofing contractor and material manufacturer.

xvii. Section 21 14 23 Storm Drainage Piping Specialties

A. The Contractor shall furnish a written five- (5) year Guaranty covering labor and materials used in the repairs/replacement against leaks and/or faulty workmanship or materials. All costs for any of the above shall be absorbed by the roofing contractor and material manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 – EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruction: Instruct COR's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Provide instructors experienced in maintenance procedures.
   2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
   3. Schedule training with COR, through Architect/Engineer, with at least 7 days' advance notice.
   4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
   1. System design and operational philosophy.
   2. Review of documentation.
   3. Troubleshooting.
   4. Maintenance.
   5. Repair.

3.2 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
   1. Complete the following cleaning operations, as applicable, before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
      a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
      b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
g. Sweep concrete floors broom clean in unoccupied spaces.
h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
j. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    1. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
k. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

- - - END - - -

SECTION 02 41 00
DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies demolition and removal of buildings, portions of buildings, utilities, other structures and debris from trash dumps shown.

1.2 RELATED WORK:

A. Disconnecting utility services prior to demolition: Section 01 00 00, GENERAL REQUIREMENTS.

C. Reserved items that are to remain the property of the Government: Section 01 00 00, GENERAL REQUIREMENTS.

D. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

E. Infectious Control: Section 01 00 00, GENERAL REQUIREMENTS, Article 1.7, INFECTION PREVENTION MEASURES.

1.3 PROTECTION:

A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures.

B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations. Comply with requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article 1.9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS.

C. Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.

D. Provide enclosed dust chutes with control gates from each floor to carry debris to truck beds and govern flow of material into truck. Provide overhead bridges of tight board or prefabricated metal construction at dust chutes to protect persons and property from falling debris.

E. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the work area daily.

F. In addition to previously listed fire and safety rules to be observed in performance of work, include following:
   1. No wall or part of wall shall be permitted to fall outwardly from structures.
   2. Maintain at least one stairway in each structure in usable condition to highest remaining floor. Keep stairway free of obstructions and debris until that level of structure has been removed.
   3. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.
   4. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 4500 mm (15 feet) of fire hydrants.

G. Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the Medical Center; any damaged items shall be repaired or replaced as approved by the Contracting Officer’s Technical Representative. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal works. Repairs, reinforcement, or structural replacement must have Contracting Officer’s Technical Representative’s approval.

H. The work shall comply with the requirements of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

I. The work shall comply with the requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article 1.7 INFECTION PREVENTION MEASURES.

1.4 UTILITY SERVICES:

A. Demolish and remove outside utility service lines shown to be removed.

B. Remove abandoned outside utility lines that would interfere with installation of new utility lines and new construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 DEMOLITION:

A. Completely demolish and remove buildings and structures, including all appurtenances related or connected thereto, as noted below:
   1. As required for installation of new utility service lines.
   2. To full depth within an area defined by hypothetical lines located 1500 mm (5 feet) outside building lines of new structures.

B. Debris, including brick, concrete, stone, metals and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Medical Center property to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer’s Technical Representative. Break up concrete slabs below grade that do not require removal from present location into pieces not exceeding 600 mm (24 inches) square to permit drainage. Contractor shall dispose debris in compliance with applicable federal, state or local permits, rules and/or regulations.

C. In removing buildings and structures of more than two stories, demolish work story by story starting at highest level and progressing down to third floor level. Demolition of first and second stories may proceed simultaneously.

D. Remove and legally dispose of all materials, other than earth to remain as part of project work, from any trash dumps shown. Materials removed shall become property of contractor and shall be disposed of in compliance with applicable federal, state or local permits, rules and/or regulations. All materials in the indicated trash dump areas, including above surrounding grade and extending to a depth of 1500mm (5feet) below surrounding grade, shall be included as part of the lump sum compensation for the work of this section. Materials that are located beneath the surface of the surrounding ground more than 1500 mm (5 feet), or materials that are discovered to be hazardous, shall be handled as unforeseen. The removal of hazardous material shall be referred to Hazardous Materials specifications.

E. Remove existing utilities as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer’s Technical Representative. When Utility lines are encountered that are

not indicated on the drawings, the Contracting Officer’s Technical Representative shall be notified prior to further work in that area.

3.2 CLEAN-UP:

On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to Contracting Officer’s Technical Representative. Clean-up shall include off the Medical Center property disposal of all items and materials not required to remain property of the Government as well as all debris and rubbish resulting from demolition operations.

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SECTION 04 01 20
MAINTENANCE OF UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Removing brick units to install a through wall flashing and weeps.
   2. Install new matching brick units where existing were removed.
   3. Remove and replace the entire brick façade as defined by the specifications and drawings.

B. Areas of Work:
   1. Clay Brick Masonry Wall sections above:
      a. Roofs 3A

C. Scope of Work:
   1. All grinders used throughout the project must be dustless grinders. Contractor must continually maintain filters and vacuums throughout the project.
   2. Prior to performing any work filter media must be installed over air intakes to prevent dust from being drawn into the building. Remove and replace media as required to ensure that HVAC components are not negatively impacted.
   3. Remove brick at designated areas for flashing related scope of work above Roofs 3A.
   4. Remove existing flashing if present
   5. Install specified flashing and weeps.
   6. Install new brick units to match existing.
   7. Clean affected masonry per specification.
   8. All specified tests are to be performed by the Contractor at the Contractor’s expense. Results of the tests must be submitted to the Consultant and COR prior to work commencing and final mortar mixture approval.
   9. Samples of mortar must be installed within enough lead time to allow it to properly cure so that the COR has the ability to properly choose a color. If the chosen color changes as a result of improper curing time or other anomaly that occurs after the COR’s approval, the installed mortar may be required to be removed and replaced at no additional cost to the COR.
   10. Submit at least three boards of bricks showing full range of color for each board, and certified to be an updated board with the actual colors of the brick they represent. COR shall choose the best from these or ask for additional samples. After the COR has chosen from a sample board, the Contractor will install the first 12 units and ask the COR to reaffirm the color choice in writing. If the COR rejects the brick color after seeing the installed sample the process will be repeated until the COR approves the wall sample at no added cost to the COR.

1.3 DEFINITIONS

A. Use the lowest pressure spray to completely clean the masonry walls without causing damage.
   1. Spray Pressure: 100 to 1200 psi; 4 to 6 gpm.

B. Deteriorated mortar joint: Any mortar joint that can be scrapped out without the use of a grinder, is recessed more than a quarter inch, or has at least one side of the joint open.

C. Deteriorated brick unit: Any brick unit that has corners chipped off, has cracked, has spalled, or is missing.

1.4 SUBMITTALS

A. Product Data: For each product indicated. Include recommendations for applications and use. Include test reports and certifications substantiating that products comply with requirements.

B. Material Safety Data: For each product indicated and/or used.

C. Samples for verification, before the preconstruction meeting, of the following:
   1. Provide a sample for each new exposed masonry material to be used for replacing existing materials. Include in each set of samples the full range of colors and textures to be expected in the completed Work.
      a. Provide straps or panels containing at least four brick units.
   2. Each type of mortar for pointing and masonry rebuilding and repair in the form of sample mortar strips, 6 inches long by 1/2 inch wide, set in aluminum or plastic channels.
   3. Each type of chemical cleaner (if applicable).
   4. Through-wall flashing
   5. All applicable test results.

D. Qualifications Data: For firms and persons specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and telephone numbers of Architects and CORs, and other information specified.

E. Restoration Program: For each phase of restoration process, including protection of surrounding materials on the buildings and Project site during operations. Describe in detail the materials, method, equipment, and sequence of operations to be used for each phase of the restoration work.
   1. If alternative material and methods to those indicated are proposed for any phase of restoration work, provide a written description, including evidence of successful use on other comparable projects, and a testing program to demonstrate their effectiveness for this Project. Approval of proposed alternates is at the sole judgment of the Architect.

F. Cleaning Program: Including cleaning process, protection of surrounding building materials and Project site, and control of runoff during operations. Describe in detail the materials, methods and equipment to be used.
   1. If material and methods other than those indicated are proposed for cleaning work, provide a written description, including evidence of successful use on other comparable projects, and testing program to demonstrate their effectiveness for this Project. Approval of proposed alternatives is a judgment made by the Architect and COR.

2. Contractor must submit to the Architect a written daily record of the spray pressure used at the point of application to clean masonry.

1.5 QUALITY ASSURANCE

A. Restoration Specialist: The masonry restoration and cleaning firm must have completed work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance for at least one year.

B. Chemical manufacturer Qualifications: A company regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project site inspection and assistance at no additional cost.

C. Sample: Prepare field samples for restoration methods and cleaning procedures to demonstrate aesthetic effects and qualities of materials and execution. Use material and methods proposed for completed Work and prepare samples under same weathers conditions to be expected during remainder of Work.
   1. Masonry Repair: Supply samples in panel form of the size indicated for each type of masonry material indicated to be patched, rebuilt, or replaced.
   2. Cleaning: If chemical cleaning agents are used, prepare sample approximately 25-sq. ft. in area for each type of clay masonry and surface condition.
      a. Test cleaners and methods on samples of adjacent material for possible adverse reactions, unless cleaners and methods are known to have a deleterious effect, then they should not be used.
      b. Allow a waiting period of not less than 7 days after completion of sample cleaning to permit a study of sample for negative reactions.
   3. Pointing: Prepare one areas approximately 36 inches high by 72 inches wide for each type of pointing required. This will be used for demonstrating methods and quality of workmanship expected in removing mortar from joints and demonstrating quality of materials and workmanship expected in pointing mortar joints.
   4. Brick Replacement: After the COR has chosen from a sample board the Contractor will install the first 12 units and ask the COR to reaffirm the color choice in writing. If the COR rejects the brick color after seeing the installed sample the process will be repeated until the COR approves the wall sample at no added cost to the COR.
   5. Notify Consultant 7 days in advance of the dates and times when samples will prepared.
   6. Obtain COR’s approval of samples before starting the remainder of clay masonry restoration and cleaning.
   7. Preconstruction Testing: Engage an independent testing agency experienced in performing the type of tests indicated and approved by Consultant to perform preconstruction tests.
   8. Preconstruction Brick Test: Test brick according to sampling and testing methods in ASTM C 67 for compressive strength.
      a. Test each proposed type of replacement brick.
      b. Test each type of existing brick indicated for replacement. Carefully remove existing bricks from locations designated by COR.
   9. All replacement bricks must not have a higher compressive strength than the brick being replaced; the Contractor shall document this in writing to the Architect and COR.
   10. Replacement mortar must have a lower compressive strength than the

surrounding bricks; the Contractor shall document this in writing to the Architect.

11. Source of Material: Obtain materials for masonry restoration from a single source for each type of material required (face brick, cement, sand, etc.) to ensure a match of quality, color, pattern, and texture.
12. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor's work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Carefully pack, handle, and ship masonry units, and accessories strapped together in suitable weatherproof packs, or pallets or heavy-duty cartons.

B. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with type and name of products and manufacturers.

C. Store cementitious material off the ground, under cover and in a dry location.

D. Store aggregates, covered, and in a dry location, where grading and other required characteristics can be maintained, and contamination avoided.

E. Comply with manufacturer's written instructions for minimum and maximum temperature requirements for storage.

1.7 PROJECT CONDITIONS

A. Use of wire brushes, steel wool, or abrasive blasting shall not be permitted unless explicitly specified herein or in the Contract Drawings.

B. Protect persons, motor vehicles, all non-masonry building surfaces (including but not limited to window glass and frames, roof, flashings and doors) and related fixtures, all metals, fittings and equipment of the building and building site, all landscaping , all outdoor sculpture and surrounding buildings, all signage, flagpoles, light poles, lighting fixtures, canopies and related materials from damage.

C. The Facility will be fully operational during the course of the project; work near building entrances shall only be permitted during restricted hours unless otherwise negotiated with the COR. When authorized, the Contractor shall protect all work and the public near building entrances.

D. Protect all operational windows, intake vents, and grills from water spray, fumes, or chemicals. Dustless grinders are to be used throughout the project.

E. Protect areas of completed cleaning work by keeping areas adjoining the work area wet.

F. CONTRACTOR shall be responsible for strict compliance with applicable federal, state, and local environmental regulations. Dispose and regulate run-off and atmospheric release from cleaning operations by legal means and in manner which controls/prevents hazardous air pollution, soil erosion, undermining of paving and foundations, damage to landscaping, and

water penetration into building interior, basements and vaults or blockage of drains. Runoff from solvent type cleaners shall be captured, containerized, and properly disposed of in accordance with applicable standards.

G. Working Conditions vs. Weather:
1. Do not clean masonry during winds of sufficient force to spread cleaning water and/or solutions to unprotected surfaces.
2. Clean masonry surfaces only when air temperatures are 45 degrees Fahrenheit and above and will remain 40 degrees Fahrenheit or above until masonry has dried out and for not less than 7 days after completion of cleaning.
3. Masonry pointing may be carried out only when air temperatures are 45 degrees Fahrenheit and above for not less than 7 days after completion of pointing.
4. Epoxy, patching, and grouting materials may only be applied to wall surfaces when air, surface and materials temperatures are within the range approved by the manufacturer.
5. Protect materials from rain, temperature extremes, and/or rapid drying by providing enclosures or coverings when required by manufacturer's specifications.
6. Pointing shall not be allowed in wet weather unless work is protected within temporary enclosures.

H. Protection of Other Work:
1. Prevent mortar, adhesives, or grout from staining surrounding masonry. Remove any spill immediately. Protect sills and ledges from mortar droppings by coating with sand.
2. No spills shall be permitted to remain at the end of each working day.

I. Do not point mortar joints or repair masonry unless air temperature is between and 40 and 80 degrees F and will remain so for at least 48 hours after completion of Work.

J. Hot-Weather Requirements: Protect restoration work when temperatures and humidity conditions produce excessive evaporation of water from mortar and patching materials. Provide artificial shade, wind breaks, and use cool materials as required. Do not apply mortar to substrates with temperatures of 90 ºF and above.

K. Prevent grout or mortar used in pointing and repair work from staining face of surrounding masonry and other surfaces. Immediately remove grout and mortar in contact with exposed masonry and other surfaces.

L. During the masonry restoration work, which is to be performed above the existing roofing systems, a comprehensive protection system shall be installed over the existing roof. This system must consist of, at a minimum, one inch polyisocyanurate and plywood banded together. The Contractor is solely and fully responsible for determining the dimensions of the protected area, and is fully and solely liable for any damage to the building resulting from this work.

1.8 SEQUENCING AND SCHEDULING

A. Order replacement material at the earliest possible date, to avoid delaying completion of the Work.

B. Perform masonry restoration work in the following sequence:
1. Remove all attached components necessary to perform restoration work.
2. Remove existing masonry where designated.

3. Install specified through-wall flashing and weeps.
4. Install new masonry.
5. Reinstall all previously attached components.
6. Perform the final cleaning of the masonry façade.

1.9 WARRANTY/GUARANTEE

A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

B. All warranties and guarantees must be submitted before retainage will be released.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
1. Flashing:
a. Lintels: High temperature Bituthene and 24 ga stainless steel

2.2 MASONRY MATERIALS

A. Face Brick and Accessories: Provide face brick and accessories, including specially molded, ground, cut, or sawed shapes where required to complete masonry restoration work.
1. Provide units with colors, surface texture, size, and shape to match existing brickwork and with physical properties not less than those determined from preconstruction testing of selected existing units.
2. Provide units with colors, surface texture, and physical properties to match existing. Match existing units in size and shape.
3. Grade SW.

2.3 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I.

B. Hydrated Lime: ASTM C 207, Type N.

C. Aggregate for Mortar: ASTM C 144, unless otherwise indicated.
1. For pointing mortar, provide aggregate and with round edges.
2. Match size, texture, and gradation of existing mortar as closely as possible.

D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides compounded for mortar mixes. Uses only pigments with a long record of satisfactory performance in masonry mortars that are documented.

E. Water: Potable

F. Note that final materials and mixture will be determined by the results of the tests required by this specification.

2.4 CLEANING MATERIAL

A. General
   1. Water for Cleaning: Potable.

B. Masonry
   1. New construction chemical cleaner. Subject to approval.

2.5 MORTAR MIX

A. Mixing Pointing Mortar: Thoroughly mechanically mix cementitious and aggregate materials together before adding any water. Then mechanically mix again adding only water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 1 to 2 hours. Add remaining water in small portions until reaching mortar of the desired consistency. Use mortar within 30 minutes of final mixing; do not retamper or use partially hardened material.

B. Colored Mortar: Produce mortar of color required by using selected ingredients. Do not adjust proportions without Consultant’s approval.

C. Mortar Pigments: Where mortar pigments are indicated, does not exceed a pigment-to-cement ratio of 1:10 by weight.

D. Do not use admixtures of any kind in mortar, unless otherwise indicated.

E. Mortar Proportions:
   1. Mix in proportions per Schedule in Ohio State Building Code, Chapter BB35-18. Use Type “N” mortar for all exterior work. Change mix as necessary to ensure that design strength is less than that of the brick compressive strength determine by testing. Change in mix is to be performed at no additional cost to the COR.
   2. Exterior Mortar: Type “N” mix: One part Portland cement, 1/2 part Type “N” mason’s lime or lime putty, not over three times combined volume of cement and lime of masonry sand to produce psi determined by testing at 28 days. Minimum 800 psi compressive strength at 28 days per ASTM C-270.
   3. Add mortar pigments to produce mortar colors required.
   4. NOTE THAT FINAL MIXTURE WILL BE DETERMINED BY THE RESULTS OF THE TESTS REQUIRED BY THIS SPECIFICATION.

2.6 MISCELLANEOUS MATERIALS

A. Stainless-Steel Sheet: ASTM A 167, Type 304 passive, soft annealed, with No. 2D finish, except where harder temper is required for forming or performance; minimum 24 gauge.

B. Rubberized-Asphalt Flashing: Manufacturer's standard high temperature composite flashing product consisting of a pliable and highly adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of 0.040 inch (1.0 mm).

C. Masonry Anchors: 1/4 inches diameter Epoxy Coated Hex Head fastener sized to ensure a minimum 1.25 inches to 1.75 inches inch embedment. Holes must be predrilled with a 3/16 inches diameter drill bit.

D. Weep/Vent Products:
   a. Honeycomb design to allow passage of moisture from cavity to the building exterior while restricting ingress of insects and other

debris, insure the entire opening is tightly filled with this weep material and will not move under pressure. Vent allows passage of moisture up to its 2 1/2 inches height, important in the event of mortar droppings at bottom of the cavity Polypropylene tested in conformance with ASTM D2240, D790B, D638, and D1238B

b. Finishes: Match mortar

c. Dimensions: Heights & width to match existing construction

E. Wall Ties: As specified under Section 04 20 00 Unit Masonry.

2.7 LIQUID FLASHING

A. Primer -

1. An organo-silane compound dispersed in isopropyl alcohol. It improves adhesion of modified flashing cement to nonporous surfaces such as metals and some plastics

B. Scrim –

1. A stitchbonded polyester scrim that offers a sturdy combination of burst strength and toughness for roofing applications. The flexible polyester allows elongation of up to 50%, providing excellent accommodation to thermal stresses and movements.

C. Flashing Cement

1. A unique, two-component, elastomeric, liquid applied flashing material, consisting of an asphalt/urethane base material and an activator. The two parts are Flashing Cement Base and Flashing Cement Activator.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Comply with chemical cleaner manufacturer’s written instructions for protecting surfaces against damage from exposure to their products.

B. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from injury resulting from masonry restoration work.

1. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be injured by such contact.
2. Do not clean masonry during winds of sufficient force to spread cleaning solution to unprotected surfaces.
3. Neutralize and collect alkaline and acid wastes for disposal off COR’s property.
4. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors
5. Erect temporary protection covers over pedestrian walkways and at points of entrance and exit for persons and vehicles that must remain in operation during course of masonry restoration work.

C. Protect adjacent surfaces from contact with chemical cleaners by covering them with a liquid strippable masking agent or polyethylene film and waterproof masking tape. Apply masking agent to comply with manufacturer’s written instructions. Do not apply liquid masking agent to

painted or porous surfaces.

3.2 MASONRY REMOVAL AND REPLACEMENT

A. Carefully remove by hand at locations where, bricks that are damage, spalled, or deteriorated. Cut out full units from joint to joint and in a manner to permit replacement with full-size units without damaging surrounding masonry.

B. Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Clean remaining brick at edges of removal area by removing mortar, dust, and loose particles in preparation for replacement.

D. Install new brick to replace removed brick. Fit replacement units into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

E. Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet clay bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g per 30-sq. in. per min. Use wetting methods that ensure units are nearly saturated but surface dry when laid. Maintain joint width for replacement units to match existing units.
   1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
   2. Rake out mortar used for laying brick before mortar sets and point new mortar joints area to comply with requirements for pointing existing masonry.

F. Install wall ties in mortar joints of newly laid brick spaced 16 inches on center horizontally and vertically. In addition, all wall ties that are removed shall be replaced with specified wall ties. Secure wall ties to masonry backup with specified masonry screw anchor and properly predrilling holes with specified drill bit.

3.3 UNUSED ANCHOR REMOVAL

A. Remove masonry anchors, brackets, wood nailers, and other extraneous items no longer in use unless identified as historically significant or indicated to remain.

B. Remove items carefully to avoid spalling or cracking masonry.

C. If item cannot be removed without damaging surrounding masonry, cut off item flush with surface and core drill surrounding masonry and item as close around item as practical.

D. Patch holes where items were removed unless directed to remove and replace units.

3.4 CONSTRUCTION TOLERANCES

A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:
   1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by

more than 1/4 inch in 20 feet, nor 1/2 inch maximum.
2. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, nor 1/2 inch maximum.
3. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet, nor 1/2 inch maximum.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow masonry units as follows:
1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
4. Lay solid brick-size masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
5. At cavity walls, bevel beds away from cavity, to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against the cavity face of the brick.
6. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.
7. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.6 THROUGH-WALL FLASHING AND WEEP INSTALLATION

A. General: Install embedded flashing and weep holes in masonry where indicated.

B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing.

C. Install flashing as follows:
1. Over exposed masonry install specified stainless steel with minimum 6 inches upturn leg on the back set in a reglet. Ends shall be form with 2 inches high minimum end tabs pop riveted 2 inches on center and fully sealed. All laps shall be overlapped minimum 1 inch, pop riveted 2 inches on center and fully sealed with sealant. Cover install flashing with specified bituthene flashing. Extend flashing a minimum of 3 inches above top of sheet metal flashing and three inches to either side.
2. Secure flashing with aluminum termination bar secured with fasteners spaced 8 inches on center.
3. Extend sheet metal flashing 1/2 inch beyond face of masonry at exterior and turn flashing down to form a drip.
4. All interior and exterior corners of throughwall flashing shall be sealed with liquid flashing, see paragraph 3.7.
5. Set the first brick course dry laid on the flashing when infilling and insure the flashing was installed in a manner that allows the mortar joints to align with adjoining masonry.

D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:

1. Space weeps every other head joint and insure a tight fit of the weep honeycomb material that will not allow the material to move under pressure.

E. See Brick Removal and Replacement section for more information.

3.7 LIQUID FLASHING

A. Surface Preparation All surfaces to receive the system must be clean, dry and free of any dirt, dust, debris, rust, and oils. Remove contaminants such as oils with a suitable solvent cleaner. For best results it is recommended that surfaces such as metals and plastics be abraded. Mask off with tape any areas not intended to receive the flashing cement.

B. Pre-cut Scrim - Lay out scrim around penetration and cut to fit. Scrim must wrap around penetration and bridge all vertical to horizontal transitions. Scrim must extend 1’ up vertical surfaces and 6” out on horizontal surfaces.

C. Primer Application - Shake bottle vigorously for 3-5 seconds prior to opening. All non-porous surfaces to receive flashing cement should be primed *no more* than 1 hour prior to application. Primer can be wiped on with a cloth rag. Surfaces only need to be wiped once. Replace soiled rags with clean rags as necessary. Wiping on the primer also helps to clean the surface. Primer may also be applied with spray bottles or Hudson type sprayers. Apply only a light mist when spraying. Do not over apply, creating puddles or runs. The primer will flash off (dry) almost immediately. Primer *must* be dry prior to applying flashing cement.

D. Flashing Cement Application - Pour Cement Activator into flashing cement Base pail and immediately mix for 3 minutes. Mix with a 1/2” (12.7 mm) drill. Drill must have a max rpm between 450 and 900. Do not mix by hand. Do not under mix. Use an 8” (203 mm) rectangular mud mixer blade or a large spiral mixer blade. For Flashing Cement Cartridges, load tube into the applicator and dispense. Once mixed Flashing Cement can be applied with rollers, brushes, and trowels/putty knives. Apply a thin base coat, minimum of 20 mils (0.51 mm), of the Flashing Cement to the penetration and the target area around the penetration. Immediately embed the pre-cut scrim into the wet coating. It is recommended that the thin base coat cure for a minimum of 30 minutes prior to top coating for ease of application. Experienced applicators may find that this is not necessary. Apply a second coat of Flashing Cement to the exposed scrim so as to completely encapsulate the scrim. A minimum of 60 mils (1.52 mm) will be required to cover the scrim. Flashing Cement should extend 2” (51 mm) past the scrim in all directions. Working time is Approximately 30 minutes, but will vary depending on temperature. See working time chart on packaging for details.

E. Cure Times - Protect coated areas from damaging conditions such as construction traffic and weather until material cures to a solid membrane. Cure times will vary depending on temperature. Warmer temperatures will decrease cure times; cooler temperatures will increase cure times.

3.8 FLASHING, WEEP HOLES, AND VENTS

A. Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated, infilling the opening with the weep material tightly so the material will not move under pressure.

B. Remove and replace steel component with new specified steel component. Ensure that all proper shoring precautions are taken.

C. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing.

D. Before covering seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

E. Install flashing as follows:
   1. Over exposed masonry install specified stainless steel with minimum 6 inches upturn leg on the back set in a reglet. Ends shall be form with 2 inches high minimum end tabs pop riveted 2 inches on center and fully sealed. All laps shall be overlapped minimum 1 inch, pop riveted 2 inches on center and fully sealed with sealant. Cover install flashing with specified bituthene flashing. Extend flashing a minimum of 3 inches above top of sheet metal flashing and three inches to either side.
   2. Secure flashing with aluminum termination bar secured with fasteners spaced 8 inches on center.
   3. Extend sheet metal flashing 1/2 inch beyond face of masonry at exterior and turn flashing down to form a drip.

F. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:
   1. Space weeps every other head joint.

G. See Brick Removal and Replacement section for more information

3.9 CLEANING MASONRY, GENERAL

A. Proceed with cleaning in orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other. Work from bottom to top of the building for each scaffold drop.

B. Use only those cleaning methods indicate for each masonry material and location.
   1. Use natural-fiber brushes only.
   2. Use spray equipment that provides controlled applications at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.
      a. Equip units with pressure gages.
   3. For chemical cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with a fan-shaped spray tip.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.

3.10 CLEANING BRICKWORK

A. All Areas: Cold-water Wash: Clean brick masonry with cold water using the lowest pressure spray possible to completely clean the brickwork without causing damage.

B. Stained Areas: Scrub masonry with Sure Klean Restoration Cleaner chemical solution only when necessary using medium soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet. Rinse with cold water to remove chemical solution

and soil.

3.11 FINAL CLEANING

B. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use stiff-nylon or fiber brushes and clean water, spray applied at a low pressure.

B. Do not use metal scrapers or brushes.

C. Do not use acidic or alkaline cleaners.

- - - END - - -

SECTION 04 05 13
MASONRY MORTARING

PART 1 - GENERAL

1.1 DESCRIPTION:

Section specifies mortar materials and mixes.

1.2 RELATED WORK:

A. Mortar used in Section:
   1. Section 04 20 00, UNIT MASONRY.

1.3 TESTING LABORATORY-CONTRACTOR RETAINED

A. Engage a commercial testing laboratory approved by Contracting Officer's Technical Representative (COR) to perform tests specified below.
B. Submit information regarding testing laboratory's facilities and qualifications of technical personnel to COR.

1.4 TESTS

A. Test mortar and materials specified.
B. Certified test reports.
C. Identify materials by type, brand name and manufacturer or by origin.
D. Do not use materials until laboratory test reports are approved by COR.
E. After tests have been made and materials approved, do not change without additional test and approval of COR.
F. Testing:
   1. Test materials proposed for use for compliance with specifications in accordance with test methods contained in referenced specifications and as follows:
   2. Mortar:
      a. Test for compressive strength and water retention; ASTM C270.
      b. Mortar compressive strengths 28 days as follows:
         Type S: Minimum 12400 kPa (1800 psi) at 28 days.
         Type N: Minimum 5170 kPa (750 psi) at 28 days.
   3. Cement:
      a. Test for water soluble alkali (nonstaining) when nonstaining cement is specified.
      b. Nonstaining cement shall contain not more than 0.03 percent water soluble alkali.
   4. Sand: Test for deleterious substances, organic impurities, soundness and grading.

1.5 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Certificates:
   1. Testing laboratory's facilities and qualifications of its technical personnel.
   2. Indicating that following items meet specifications:
      a. Portland cement.
      b. Masonry cement.
      c. Mortar cement.
      d. Hydrated lime.
      e. Fine aggregate (sand).

C. Laboratory Test Reports:
   1. Mortar, each type.
   2. Admixtures.

D. Manufacturer's Literature and Data:
   1. Cement, each kind.
   2. Hydrated lime.
   3. Admixtures.
   4. Liquid acrylic resin.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver masonry materials in original sealed containers marked with name of manufacturer and identification of contents.

B. Store masonry materials under waterproof covers on planking clear of ground, and protect damage from handling, dirt, stain, water and wind.

1.7 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Society for Testing and Materials (ASTM):

C40-04.....Organic Impurities in Fine Aggregates for Concrete
C91-05.....Masonry Cement
C109-08.....Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-MM Cube Specimens)
C144-04.....Aggregate for Masonry Mortar
C150-09.....Portland Cement
C207-06.....Hydrated Lime for Masonry Purposes
C270-10.....Mortar for Unit Masonry
C307-03(R2008).....Tensile Strength of Chemical - Resistant Mortar, Grouts, and Monolithic Surfacing
C321-00(R2005).....Bond Strength of Chemical-Resistant Mortars
C348-08.....Flexural Strength of Hydraulic Cement Mortars
C595-10.....Blended Hydraulic Cement

C780-10.....Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry

C979-10.....Pigments for Integrally Colored Concrete

C1329-05.....Mortar Cement

1.8 WARRANTY

A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

PART 2 - PRODUCTS

2.1 HYDRATED LIME

ASTM C207, Type S.

2.2 AGGREGATE FOR MASONRY MORTAR

A. ASTM C144 and as follows:

1. Light colored sand for mortar for laying face brick.

B. Test sand for color value in accordance with ASTM C40. Sand producing color darker than specified standard is unacceptable.

2.3 BLENDED HYDRAULIC CEMENT

ASTM C595, Type IS, IP.

2.4 MASONRY CEMENT

A. ASTM C91. Type N or S.

2.5 MORTAR CEMEMT

ASTM C1329, Type N or S.

2.6 PORTLAND CEMENT

A. ASTM C150, Type I.

2.7 LIQUID ACRYLIC RESIN

A formulation of acrylic polymers and modifiers in liquid form designed for use as an additive for mortar to improve physical properties.

2.8 WATER

Potable, free of substances that are detrimental to mortar, masonry, and metal.

2.9 MASONRY MORTAR

A. Conform to ASTM C270.

B. Admixtures:

1. Do not use mortar admixtures, unless approved by COR.
2. Submit laboratory test report showing effect of proposed admixture on strength, water retention, and water repellency of mortar.
3. Do not use antifreeze compounds.

PART 3 - EXECUTION

3.1 MIXING

A. Mix in a mechanically operated mortar mixer.
   1. Mix mortar for at least three minutes but not more than five minutes.
B. Measure ingredients by volume. Measure by the use of a container of known capacity.
C. Mix water with dry ingredients in sufficient amount to provide a workable mixture which will adhere to vertical surfaces of masonry units.
   1. Discard mortar that has reached its initial set or has not been used within two hours.

3.2 MORTAR USE LOCATION

A. For brick veneer over frame back up walls, use Type N portland cement-lime mortar or Type S masonry cement or mortar cement mortar.

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SECTION 04 20 00
UNIT MASONRY

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies requirements for construction of masonry unit walls.

1.2 RELATED WORK

A. Mortars: Section 04 05 13, MASONRY MORTARING.

B. Steel lintels and shelf angles: Section 05 50 00, METAL FABRICATIONS.

C. Flashing: Section 07 62 00, SHEET METAL FLASHING AND TRIM.

D. Sealants and sealant installation: Section 07 92 00, JOINT SEALANTS.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. Samples:

1. Face brick, sample panel, 200 mm by 400 mm (8 inches by 16 inches,) showing full color range and texture of bricks, bond, and proposed mortar joints.
2. Anchors, and ties, one each and joint reinforcing 1200 mm (48 inches) long.

C. Certificates:

1. Certificates signed by manufacturer, including name and address of contractor, project location, and the quantity, and date or dates of shipment of delivery to which certificate applies.
2. Indicating that the following items meet specification requirements:
   a. Face brick.

D. Manufacturer's Literature and Data:

1. Anchors, ties, and reinforcement.

1.4 WARRANTY

A. Warrant exterior masonry walls against moisture leaks and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be five years.

B. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

1.5 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

C62-10.....Building Brick (Solid Masonry Units Made From Clay or Shale)

C90-11.....Load Bearing Concrete Masonry Units

C216-10.....Facing Brick (Solid Masonry Units Made From Clay or Shale)

C476-10.....Standard Specification for Grout for Masonry

D1056-07.....Flexible Cellular Materials - Sponge or Expanded Rubber

D2000-08.....Rubber Products in Automotive Applications

D2240-05(R2010).....Rubber Property - Durometer Hardness

D3574-08.....Flexible Cellular Materials-Slab, Bonded, and Molded Urethane Foams

F1667-11.....Fasteners: Nails, Spikes and Staples

C. Masonry Industry Council:

Hot and Cold Weather Masonry Construction Manual-98 (R2000).

D. Federal Specifications (FS):

FF-S-107C-00.....Screws, Tapping and Drive

E. Brick Industry Association - Technical Notes on Brick Construction (BIA):

11-2001.....Guide Specifications for Brick Masonry, Part I

11A–1988.....Guide Specifications for Brick Masonry, Part II

11B–1988.....Guide Specifications for Brick Masonry, Part III Execution

11C-1998.....Guide Specification for Brick Masonry Engineered Brick Masonry, Part IV

11D-1988.....Guide Specifications for Brick Masonry Engineered Brick Masonry, Part IV continued

F. Masonry Standards Joint Committee; Specifications for Masonry Structures TMS 602-08/ACI 530.1-08/ASCE 6-08 (2008 MSJC Book Version TMS-0402-08).

PART 2 - PRODUCTS

2.1 BRICK

A. Face Brick:

1. ASTM C216, Grade SW, Type FBS.
2. Brick when tested in accordance with ASTM C67: Classified slightly efflorescent or better.
3. Size:

a. Ambassador

4. Face brick at through-wall-flashing repair: Match existing texture and color of past projects.

2.2 CONCRETE MASONRY UNITS

A. Hollow and Solid Load-Bearing Concrete Masonry Units: ASTM C90.
   1. Unit Weight: Normal weight.
   2. Sizes: Modular.

2.3 ANCHORS, TIES, AND REINFORCEMENT

A. Adjustable Veneer Anchor for Frame Walls:
   1. Two piece, adjustable anchor and tie.
   2. Adjustable veneer anchor shall with back plate and adjustable pintle be designed to anchor masonry to structure accommodating rigid insulation 3 inches thick. Furnish with two 9/32" diameter holes.
   3. Insulation thickness: 3 inches.
   4. Air cavity: 1 inch.
   5. Back Plate: 12 gage, hot-dip galvanized steel, ASTM A1008.
   6. Pintle: 3/16" diameter cold-drawn steel wire, ASTM A82 length as required to engage the anchor and be embedded not less than 2 inches into the bed joint of the masonry veneer.
   7. Hot-Dip Galvanizing after fabrication: ASTM A153.

2.4 PREFORMED COMPRESSIBLE JOINT FILLER

A. Thickness and depth to fill the joint as specified.
B. Closed Cell Neoprene: ASTM D1056, Type 2, Class A, Grade 1, B2F1.
C. Non-Combustible Type: ASTM C612, Class 5, 1800 degrees F.

2.5 ACCESSORIES

A. Weep Hole Wicks: Glass fiber ropes, 10 mm (3/8 inch) minimum diameter, 300 mm (12 inches) long.
B. Masonry Cleaner:
   1. Detergent type cleaner selected for each type masonry used.
   2. Acid cleaners are not acceptable.
   3. Use soapless type specially prepared for cleaning brick or concrete masonry as appropriate.
C. Fasteners:
   1. Concrete Nails: ASTM F1667, Type I, Style 11, 19 mm (3/4 inch) minimum length.
   2. Masonry Nails: ASTM F1667, Type I, Style 17, 19 mm (3/4 inch) minimum length.
   3. Screws: FS-FF-S-107, Type A, AB, SF thread forming or cutting.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

A. Protection:
   1. Cover tops of walls with nonstaining waterproof covering, when work is not in progress. Secure to prevent wind blow off.
   2. On new work protect base of wall from mud, dirt, mortar droppings, and other materials that will stain face, until final landscaping or other site work is completed.

B. Cold Weather Protection:
   1. Masonry may be laid in freezing weather when methods of protection are utilized.
   2. Comply with MSJC and “Hot and Cold Weather Masonry Construction Manual”.

3.2 CONSTRUCTION TOLERANCES

A. Lay masonry units plumb, level and true to line within the tolerances as per MSJC requirements and as follows:

B. Maximum variation from plumb:
   1. In 3000 mm (10 feet) - 6 mm (1/4 inch).
   2. In 6000 mm (20 feet) - 10 mm (3/8 inch).
   3. In 12 000 mm (40 feet) or more - 13 mm (1/2 inch).

C. Maximum variation from level:
   1. In any bay or up to 6000 mm (20 feet) - 6 mm (1/4 inch).
   2. In 12 000 mm (40 feet) or more - 13 mm (1/2 inch).

D. Maximum variation from linear building lines:
   1. In any bay or up to 6000 mm (20 feet) - 13 mm (1/2 inch).
   2. In 12 000 mm (40 feet) or more - 19 mm (3/4 inch).

E. Maximum variation in cross-sectional dimensions of columns and thickness of walls from dimensions shown:
   1. Minus 6 mm (1/4 inch).
   2. Plus 13 mm (1/2 inch).

F. Maximum variation in prepared opening dimensions:
   1. Accurate to minus 0 mm (0 inch).
   2. Plus 6 mm (1/4 inch).

3.3 INSTALLATION GENERAL

A. Keep finish work free from mortar smears or spatters, and leave neat and clean.

B. Anchor masonry as specified in Paragraph, ANCHORAGE.

C. Wall Openings:
   1. Fill hollow metal frames built into masonry walls and partitions solid with mortar as laying of masonry progresses.

2. If items are not available when walls are built, prepare openings for subsequent installation.

D. Tooling Joints:
   1. Do not tool until mortar has stiffened enough to retain thumb print when thumb is pressed against mortar.
   2. Tool while mortar is soft enough to be compressed into joints and not raked out.
   3. Finish joints in exterior face masonry work with a jointing tool, and provide smooth, water-tight concave joint unless specified otherwise.
   4. Tool Exposed interior joints in finish work concave unless specified otherwise.

E. Lintels:
   1. Length for minimum bearing of 100 mm (4 inches) at ends.

F. Wetting and Wetting Test:
   1. Test and wet brick or clay tile in accordance with BIA 11B.
   2. Do not wet concrete masonry units or glazed structural facing tile before laying.

3.4 ANCHORAGE

A. Veneer to Frame Walls:
   1. Use adjustable veneer anchors.
   2. Fasten anchor to stud through sheathing with self drilling and tapping screw, in accordance with manufacturers instructions.
   3. Space anchors not more than 400 mm (16 inches) on center vertically at each stud.

3.5 BRICK EXPANSION JOINTS.

A. Provide brick expansion (BEJ) joints where shown on drawings.

B. Keep joint free of mortar and other debris.

C. Where joints occur in masonry walls.
   1. Install preformed compressible joint filler in brick wythe.
   2. Install cross shaped shear keys in concrete masonry unit wythe with preformed compressible joint filler on each side of shear key unless otherwise specified.
   3. Install filler, backer rod, and sealant on exposed faces.

D. Fill opening in exposed face of expansion and control joints with sealant as specified in Section 07 92 00, JOINT SEALANTS.

3.6 BRICKWORK

A. Lay clay brick in accordance with BIA Technical Note 11 series.

B. Laying:

1. Lay brick in running bond with course of masonry bonded at corners unless shown otherwise. Match bond of existing building on alterations and additions.
2. Maintain bond pattern throughout.
3. Do not use brick smaller than half-brick at any angle, corner, break or jamb.
4. Where length of cut brick is greater than one half but less than a whole brick, maintain the vertical joint location of such units.
5. Lay exposed brickwork joints symmetrical about center lines of openings.
6. Do not structural bond multi wythe brick walls unless shown.
7. Before starting work, lay facing brick on foundation wall and adjust bond to openings, angles, and corners.
8. Lay brick for sills with wash and drip.
9. Build solid brickwork as required for anchorage of items.

C. Joints:
1. Exterior and interior joint widths: Lay for three equal joints in 200 mm (eight inches) vertically, unless shown otherwise.
2. Rake joints for pointing with colored mortar when colored mortar is not full depth.

D. Weep Holes:
1. Install weep holes at 600 mm (24 inches) on center in bottom of vertical joints of exterior masonry veneer or cavity wall facing over foundations, bond beams, and other water stops in the wall.
2. Form weep holes using wicks made of mineral fiber insulation strips turned up 200 mm (8 inches) in cavity. Anchor top of strip to backup to securely hold in place.
3. Install sand or pea gravel in cavity approximately 75 mm (3 inches) high between weep holes.

E. Cavity Type Exterior Walls:
1. Keep air space clean of mortar accumulations and debris.
   a. Clean cavity by use of hard rubber, wood or metal channel strips having soft material on sides contacting wythes.
   b. Lift strips with wires before placing next courses of horizontal joint reinforcement or individual ties or adjustable cavity wall ties.
2. Veneer Framed Walls:
   a. Build with 100 mm (4 inches) of face brick over sheathed stud wall with air space.
   b. Keep air space clean of mortar accumulations and debris.

3.7 CONCRETE MASONRY UNITS

A. Laying:

1. Lay concrete masonry units with 10 mm (3/8 inch) joints, with a bond overlap of not less than 1/4 of the unit length, except where stack bond is required.
2. Do not wet concrete masonry units before laying.
3. Lay first course in a full mortar bed.
4. Provide a 6 mm (1/4 inch) open joint for caulking between existing construction, exterior walls, concrete work, and abutting masonry partitions.
5. Lay concrete masonry units with full face shell mortar beds and fill head joint beds for depth equivalent to face shell thickness.

3.8 POINTING

A. Fill joints with pointing mortar using rubber float trowel to rub mortar solidly into raked joints.

B. Wipe off excess mortar from joints of glazed masonry units with dry cloth.

C. Finish exposed joints in finish work with a jointing tool to provide a smooth concave joint unless specified otherwise.

D. At joints with existing work match existing joint.

3.8 CLEANING AND REPAIR

A. General:

1. Clean exposed masonry surfaces on completion.
2. Protect adjoining construction materials and landscaping during cleaning operations.
3. Cut out defective exposed new joints to depth of approximately 19 mm (3/4 inch) and repoint.
4. Remove mortar droppings and other foreign substances from wall surfaces.

B. Brickwork:

1. First wet surfaces with clean water, then wash down with a solution of soapless detergent. Do not use muriatic acid.
2. Brush with stiff fiber brushes while washing, and immediately thereafter hose down with clean water.
3. Free clean surfaces of traces of detergent, foreign streaks, or stains of any nature.

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SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies items and assemblies fabricated from structural steel shapes and other materials as shown and specified.

B. Items specified.

1. Loose Lintels
2. Modular Channel Units
3. Steel Framing

1.2 RELATED WORK

A. Prime and finish painting: Section 09 90 00, EXTERIOR PAINTING.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings:

1. Each item specified, showing complete detail, location in the project, material and size of components, method of joining various components and assemblies, finish, and location, size and type of anchors.
2. Mark items requiring field assembly for erection identification and furnish erection drawings and instructions.
3. Provide templates and rough-in measurements as required.

C. Furnish setting drawings and instructions for installation of anchors to be preset into concrete and masonry work, and for the positioning of items having anchors to be built into concrete or masonry construction.

1.4 QUALITY ASSURANCE

A. Each manufactured product shall meet, as a minimum, the requirements specified, and shall be a standard commercial product of a manufacturer regularly presently manufacturing items of type specified.

B. Each product type shall be the same and be made by the same manufacturer.

C. Assembled product to the greatest extent possible before delivery to the site.

D. Include additional features, which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product.

1.5 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

A36/A36M-08.....Structural Steel

A123-09.....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A391/A391M-07.....Grade 80 Alloy Steel Chain

A653/A653M-10.....Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process

C. Structural Steel Painting Council (SSPC)/Society of Protective Coatings:

SP 1-04.....No. 1, Solvent Cleaning

SP 2-04.....No. 2, Hand Tool Cleaning

SP 3-04.....No. 3, Power Tool Cleaning

0.6 WARRANTY/GUARANTEE

A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

B. All warranties and guarantees must be submitted before retainage will be released.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Steel: ASTM A36.

B. Modular Channel Units:

1. Factory fabricated, channel shaped, cold formed sheet steel shapes, complete with fittings bolts and nuts required for assembly.
2. For channel within turned pyramid shaped clamping ridges on each side.
3. Provide case hardened steel nuts with serrated grooves in the top edges designed to be inserted in the channel at any point and be given a quarter turn so as to engage the channel clamping ridges. Provide each nut with a spring designed to hold the nut in place.
4. Factory finish channels and parts with oven baked primer when exposed to view. Channels fabricated of ASTM A525, G90 galvanized steel may have primer omitted in concealed locations. Finish screws and nuts with zinc coating.
5. Fabricate snap-in closure plates to fit an close exposed channel openings of not more than 0.3 mm (0.0125 inch) thick stainless steel.

C. Primer Paint: As specified in Section 09 91 00, PAINTING.

2.2 FABRICATION GENERAL

A. Material

1. Use material as specified. Use material of commercial quality and suitable for intended purpose for material that is not named or its standard of quality not specified.
2. Use material free of defects which could affect the appearance or service ability of the finished product.

B. Size:
1. Size and thickness of members as shown.
2. When size and thickness is not specified or shown for an individual part, use size and thickness not less than that used for the same component on similar standard commercial items or in accordance with established shop methods.

C. Workmanship
1. General:
a. Fabricate items to design shown.
b. Furnish members in longest lengths commercially available within the limits shown and specified.
c. Fabricate straight, true, free from warp and twist, and where applicable square and in same plane.
d. Fabricate surfaces and edges free from sharp edges, burrs and projections which may cause injury.
2. Cutting and Fitting:
a. Accurately cut, machine and fit joints, corners, copes, and miters.

D. Finish:
1. Finish exposed surfaces in accordance with NAAMM Metal Finishes Manual.
2. Steel and Iron: NAAMM AMP 504.
a. Zinc coated (Galvanized): ASTM A123, G90. Galvanize all exterior steel.
b. Surfaces exposed in the finished work:
1) Finish smooth rough surfaces and remove projections.
2) Fill holes, dents and similar voids and depressions with epoxy type patching compound.
c. Shop Prime Painting:
1) Surfaces of Ferrous metal:
a) Items not specified to have other coatings.
b) Galvanized surfaces specified to have prime paint.
c) Remove all loose mill scale, rust, and paint, by hand or power tool cleaning as defined in SSPC-SP2 and SP3.
d) Clean of oil, grease, soil and other detrimental matter by use of solvents or cleaning compounds as defined in SSPC-SP1.

e) After cleaning and finishing apply one coat of primer as specified in Section 09 91 00, PAINTING.

2) Non ferrous metals: Comply with MAAMM-500 series.

G. Protection:

1. Spot prime all abraded and damaged areas of zinc coating which expose the bare metal, using zinc rich paint on hot-dip zinc coat items and zinc dust primer on all other zinc coated items.

2.3 LOOSE LINTELS

A. Furnish lintels of sizes shown. Where size of lintels is not shown, provide the sizes specified.

B. Fabricate lintels with not less than 150 mm (6 inch) bearing at each end for nonbearing masonry walls, and 200 mm (8 inch) bearing at each end for bearing walls.

C. Provide one angle lintel for each 100 mm (4 inches) of masonry thickness as follows except as otherwise specified or shown.

1. Openings 750 mm to 1800 mm (2-1/2 feet to 6 feet) - 100 x 90 x 8 mm (4 x 3-1/2 x 5/16 inch).
2. Openings 1800 mm to 3000 mm (6 feet to 10 feet) - 150 x 90 x 9 mm (6 x 3-1/2 x 3/8 inch).

D. Provide bearing plates for lintels where shown.

E. Weld or bolt upstanding legs of double angle lintels together with 19 mm (3/4 inch bolts) spaced at 300 mm (12 inches) on centers.

F. Insert spreaders at bolt points to separate the angles for insertion of metal windows, louver, and other anchorage.

G. Where shown or specified, punch upstanding legs of single lintels to suit size and spacing of anchor bolts.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set work accurately, in alignment and where shown, plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.

B. Items set into masonry.

1. Provide temporary bracing for such items until concrete or masonry is set.
2. Place in accordance with setting drawings and instructions.
3. Build strap anchors, into masonry as work progresses.

C. Spot prime all abraded and damaged areas of zinc coating as specified and all abraded and damaged areas of shop prime coat with same kind of paint used for shop priming.

3.2 STEEL LINTELS

A. Use lintel sizes and combinations shown or specified.

B. Install lintels with longest leg upstanding, except for openings in 150 mm (6 inch) masonry walls install lintels with longest leg horizontal.

C. Install lintels to have not less than 150 mm (6 inch) bearing at each end for nonbearing walls.

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SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Rooftop equipment bases and support curbs.
   2. Wood furring, grounds, nailers, and blocking.

B. Area of Work:
   1. Roofs 3A and 3B

C. Scope of Work:
   1. All existing wood nailers and backing materials are to be removed and replaced with new properly treated lumber.
   2. All new wood must be installed to match new roof system installation heights, to create all details, and/or to ensure proper flashing heights. If ductwork, electrical components, gas components, etc. need to be modified, extended, etc.; this work is included in this project’s scope of work and within the base bid.
   3. Care must be taken to ensure that the perimeter of each individual roof elevation is level and consistent. High quality carpentry workmanship will be required by the Contractor to ensure this level and consistent installation everywhere wood is installed.
   4. All wood exposed to occupied space shall be fire retardant treated lumber. All other lumber shall be exterior grade.

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data and Material Safety Data Sheets for each type of product specified. Submit manufacturer’s detailed technical product data, installation instructions, and recommendations, including details of construction relative to materials, dimensions or individual components, profiles, and finishes.

C. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:

1. For fire-retardant-treated wood products, include certification by treating plant that treated materials comply with specified standard and other requirements as well as data relative to bending strength, stiffness, and fastener-holding capacities of treated materials.
2. Power-driven fasteners.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility for Fire-Retardant-Treated Wood: Obtain each type of treated wood products from one source and by a single producer.

B. Installer Qualifications: The Installer must have completed work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance for at least one year in similar work. In addition, said Installer must be in a solvent financial condition.

C. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings. Do not use plastic or non-breathable tarps for protection.

B. For lumber treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

1.6 WARRANTY/GUARANTEE

A. The Contractor shall furnish a written one- (1) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be the responsibility of the Contractor and material manufacturer.

B. Standard written warranty of chemical treatment manufacturer for the performance of each type of treatment.

C. All warranties and guarantees must be submitted before retainage will be released.

PART 2 –PRODUCTS

2.0 LUMBER, GENERAL

A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.

B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
   1. NELMA - Northeastern Lumber Manufacturers Association.

C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

D. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps and provide grade-compliance certificates issued by inspection agency.

E. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.

2.1 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated wood is indicated, comply with applicable requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL; U.S. Testing; Timber Products Inspection, Inc.; or another testing and inspecting agency acceptable to authorities having jurisdiction.

B. Research or Evaluation Reports: Provide fire-retardant-treated wood acceptable to authorities having jurisdiction and for which a current model code research or evaluation report exists that evidences compliance of fire-retardant-treated wood for application indicated.

C. Exterior Type: Use for exterior locations and where indicated.

D. Inspect each piece of treated lumber after drying and discard damaged or defective pieces.

2.2 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.

B. Other Framing Not Listed Above: Provide the following grades and species:
   1. Grade: No. 2.

2.3 SHEATHING

A. Oriented-Strand-Board Wall Sheathing: Exposure 1 sheathing.
   1. Span Rating: Not less than 24/16.
   2. Nominal Thickness: Not less than 23/32 inch.

2.4 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.

2.5 FASTENERS

A. General: Provide fasteners of size that will extend a minimum of ¾ inch into lumber and type indicated that comply with requirements specified in this Article for material and manufacturer.

B. Wood Screws:
1. Description: #12 epoxy coated fastener to meet FM 4470 and with #3 truss head. (To be used to connect nailers to each other.)

C. Self-Tapping Steel Fasteners:
1. Description: Galvanized steel self-drilling fastener w/ wings (To be used to connect nailers to structural steel components) Note predrill holes as required for fastener installation.

D. Concrete/Masonry Anchors:
1. Description: 1/4″ diameter stainless steel Hex Head fastener sized to ensure a minimum 1.25″ to 1.75″ inch embedment. Holes must be predrilled with a 3/16″ diameter drill bit. (To be used to connect nailers to concrete deck, coping stones, and vertical masonry wall surfaces)

PART 3 – EXECUTION

3.0 REMOVAL/DEMOLITION

A. Remove all existing wood components that are uncovered during the roof and sheet metal removal.

3.1 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Make all wood plumb, true, and level, inconsequential of the building components they are being attached to.

C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
   1. Securely attach carpentry work as indicated and according to all applicable codes and recognized standards. All carpentry shall be fastened at a minimum of 12 inches on center with the fasteners staggered, if unless otherwise denoted.
   2. When securing to concrete or masonry components, each location must be pre-drilled.

E. Once wood has been installed it must be immediately covered with a single ply of specified membrane or flashing. Any wood that becomes wet or damp in anyway shall be removed and replaced.

F. Nails may not be used at any times to secure materials.

3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

A. Install wood grounds, nailers, blocking, and sleepers where shown or where it is found to be needed for proper system installation and where required for securing or attaching other work. Form to shapes shown or as needed if not shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach to substrates to support applied loading. Recess fasteners flush with surfaces, unless otherwise indicated. Existing fasteners cannot be used. New fasteners must be used to ensure fastener density and spacing is equaled but not less than specified.

C. Use specified masonry anchor system anchor for securement of the base piece of lumber to concrete and masonry substrates. Fasteners are to be installed every 12 inches on center, minimum, and have a minimum 1-3/4″ embedment in substrate. Note cell of masonry shall be filled with non shrink grout as required to ensure a proper substrate for securement. Note all lumber in assembly is to be secured to the installed stainless steel threaded rod with a stainless steel locking washer and a locking stainless steel nut, which must be countersunk.

D. Use specified fasteners for securement in wood or to secure wood nailers to each other. Fastener to be installed every 12 inches on center, staggered.

E. Use specified self-tapping fastener to secure nailer to structural steel components at perimeter. Note nailer shall be secure through deck into underlying support component spacing fasteners a maximum of 12 inches on center. The threads of the fastener shall project through supporting metal a minimum of ¼-inch and a maximum of ¾-inch.

3.3 WOOD CURBS AND RAISING OF UNITS

A. Where rooftop equipment units and curbs need to be raised to ensure 8-inch minimum flashing height, and new sheet metal curbs and rails are not specified the following procedures and materials shall be used:
   1. Disconnect all electrical conduits, condensate lines, etc. Hire licensed HVAC and electrical subcontractors to perform all work, including reconnection work. Note that if HVAC or gas lines need to be drained and recharged, those costs shall be included in the contract. Coordinate with COR for times when equipment can be shut down without adversely affecting the COR. Times for work may be during off-hours or weekends with no change in contract price.
   2. Create all work out of specified fire treated lumber.
   3. Wood shall be cut to size to match existing curb. Secure all new lumber to existing curb. Space all fasteners eight inches on center. Where multiple layers are required, stagger joints so that they never line up.
   4. If interior of component to be raised is covered with drywall, new matching drywall shall be installed to cover the new materials. Care must be taken to apply tape, joint compound, and paint to match appearance of existing finish.

3.4 SHEATHING INSTALLATION

A. Secure OSB with specified fasteners spaced 12 inches on center.

B. See drawing set for further details.

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SECTION 07 13 30
FULLY ADHERED EIP

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. EIP Membrane
   2. Polyisocyanurate Insulation
   3. Cover board
   4. Deck restoration

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. All Divisions

C. Unit Prices: Refer to Division 1 Section "Unit Prices" for description of Work in this Section affected by unit prices.

D. Area of Work:
   1. Roof 3A – Duct Shaft
   2. Roof 3C

E. Scope of Work:
   1. Remove of all roof materials, etc., down to the concrete deck and properly dispose of offsite.
   2. Prepare and patch deteriorated concrete per specification. There are the following quantities in the base bid which will be adjusted by the unit price.
      a. Roof 3A Duct Shaft – 2sf
      b. Roof 3C – 5 sf
   3. Install the new waterproofing system as designed. During installation termination bar and sealant must be installed every day when new materials are installed.
   4. System must be inspected by manufacturer’s non-sales technical representative, including the probing of all field and flashing seams, and also must pass manufacturer’s inspection prior to installation of overburden.
   5. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

6. No materials or human traffic may occur over installed membrane except for the installation of the insulation, pavers, and associated sheet metal components. Further, no storing of materials will be permitted on the installed membrane. This means the contractor needs to sequence the roof installation to ensure the membrane or finished roof system does not get trafficked when doing the next roof area, for both roof removal debris and new product delivery and installation.

C. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.

D. Shop Drawings: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

E. Samples: For the following products:
1. Concrete roof paver, full sized, in each color and texture required.
2. Ballast in specified size and type.

F. Sample Warranty: Copy of special waterproofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions before starting waterproofing.

1.3 QUALITY ASSURANCE

A. The EIP membrane roofing system must achieve a UL Class A and/or FM 1-90 rating.

B. Manufacturer Qualifications: Membrane must have been designed and manufactured solely by the company, without formulation or reinforcement change and without change in company ownership and name, for the past 20 consecutive years.

C. Unless otherwise noted in this specification, the roofing Contractor shall strictly comply with the manufacturer's current specifications and details.

D. Installer Qualifications: The Installer must have completed work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance for at least one (1) project of similar scope in the last three (3) years. In addition, said Contractor must be in a solvent financial condition for the past two (2) consecutive years. The Contractor will need to prove they are approved and authorized by the Manufacturer to install the roof system for the specified warranty.

E. Provide adequate number of experienced workers regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.

F. There shall be no deviations made from this specification or the ap-

proved shop drawings without the prior written approval of the Consultant. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the Consultant's consideration.

G. The Contractor shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer for the first 2 full days of membrane and flashing installation and then periodically as required by the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building COR seventy-two (72) hours prior to the manufacturer's final inspection. System must be inspected by manufacturer’s non-sales technical representative, including the probing of ALL field and flashing seams, and also must pass manufacturer’s inspection prior to installation of overburden.

H. Fire-Test-Response Characteristics: Provide roofing materials with the fire test response characteristics indicated as determined by testing identical products per test method indicated below by UL, FM, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and slopes indicated.
   2. Fire-Resistant Ratings: ASTM E119, for fire-resistance, rated roof assemblies applicable to this system.

I. Preinstallation Conference: Before installing roofing system, conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings”. Notify participants at least 5 working days before conference.
   1. Meet with COR; Consultant; COR's insurer, if applicable, roofing Installer; roofing system manufacturer's representative; deck Installer; and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   3. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
   4. Review governing regulations and requirements for insurance, certificates, and inspection and testing, if applicable.
   5. Review temporary protection requirements for roofing system during and after installation.
   6. Review roof observation and repair procedures after roofing installation.
   7. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

J. The manufacturer must have a technical representative on site to observe the membrane and flashing installation for a minimum of the first 2 days during the installation of the membrane and flashing, and then periodically as required by the manufacturer; and all seams will be inspected by technician prior to overburden installation. Note that the technical representative does not need to be onsite during the removal of existing roof materials. Additionally, the installed roof system Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 28 years and who has experience with observing EIP COMPOSITE PRMA roof installations within the past 24 months, to observe all of the prime contractor's work for all technical divisions of the project on a full time basis each and every day the contractors are on site.

K. Inspections
   1. The membrane manufacturer representative must be informed by the roofing contractor sufficiently in advance of the prejob conference and of when any roofing work will commence so that the job may be reviewed in advance, prejob conferences attended, and appropriate inspections scheduled.

L. Deviations from Specification
   1. There shall be no deviation made from Membrane Manufacturer specifications without prior written approval by Membrane Manufacturer and the COR.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, warm, well-ventilated, weather-tight location according to roofing system manufacturer's written instructions. Store rolls of felt and other sheet materials on end on pallets or other raised surfaces. Do not double-stack rolls.
   1. Handle and store roofing materials and place equipment in a manner to avoid significant or permanent deck or structural supporting members.

B. Do not leave unused felts and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 deg F (10 deg C).

C. Deliver and store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

D. Protect roofing insulation and decking materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

E. If tarps are used to protect materials, the tarpaulins must be non-sweating and secured to the materials in a non-destructive manner and must drape onto the ground or roof surface.

F. No materials can be exposed to the elements. If materials are found to be or have been exposed to the elements, they will be considered damaged. Any damaged materials cannot be used and must be immediately removed from the site.

G. All packaging materials, i.e. shrink-wrap, must be removed from all insulation materials prior to cover the materials with tarpaulins. The contractor must then secure all materials to ensure that no materials become a safety issue.

H. No materials can be stored on the finished roof or adjoining roofing systems which are under warranty without prior approval of the COR and the use of protection consisting of, at a minimum, .5 inch plywood and 1.5 inch polyisocyanurate insulation banded together.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Apply waterproofing within range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply roofing to a damp or wet substrate.
1. Do not apply roofing in snow, rain, fog, or mist.

B. Maintain adequate ventilation during preparation and application of roofing materials.

1.6 WARRANTY

A. Manufacturer's Warranty: The Contractor shall obtain the Membrane manufacturer’s written warranty covering the entire roofing system for 20-years and from wind damage for up to 90-mph winds, including removal and replacement without charge to the Owner. The Contractor shall also obtain the roofing manufacturer’s 20-year written warranty, agreeing to repair or replace roofing that does not comply with requirements and/or that does not remain watertight within specified warranty period.
1. Warranty Period: 20 years after date of Substantial Completion.
2. A wind guaranty up to 90-mph.

B. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and/or faulty workmanship and/or materials. Guaranty shall include removal and replacement of all overburden when repairing any leaks without cost to the Owner. All costs for any warranties and guaranties in paragraphs A and B shall be paid by the Contractor and material manufacturer.

C. Warranties and guarantees must be submitted before retainage will be released.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the following products:
   1. Membrane:
      a. EIP
   2. Polyisocyanurate insulation:
      a. As approved and supplied through Manufacturer
   3. Cover Board
   4. Fasteners
      a. Manufacturers approved
   5. Insulation Adhesive
      a. Manufacturers approved
   6. Concrete Patch Material

2.2 SHEET WATERPROOFING

A. Approved Membranes:
   1. Polyvinyl Chloride, 60 mil, thermoplastic roofing membrane meeting or exceeding ASTM D4434, Type III performance standards and containing KEE (Ketone ethylene ester)
   2. Polyvinyl Chloride, 60 mil, thermoplastic roofing membrane meeting or exceeding ASTM D6754 performance standards and containing KEE (Ketone ethylene ester)

B. Flashing Membrane:
   1. Polyvinyl Chloride, 60 mil, thermoplastic waterproofing membrane meeting or exceeding ASTM D4434, Type III or ASTM D6754 performance standards and containing KEE (Ketone ethylene ester)

2.3 POLYISOCYANURATE INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements, selected from manufacturer's standard sizes and of thicknesses indicated.
   1. Provide preformed, polyisocyanurate tapered insulation boards where indicated for sloping the field of the roof to the drainage components. Fabricate with the following taper:
      . Slope: ¼ inch per foot.

1. Provide preformed polyisocyanurate saddles, crickets, tapered edge strips, and other insulation shapes where necessary to provide for sloping to drain. All saddles are to have 4-way slope, twice that of the roof deck, or tapered insulation system, and in no case should the width of the saddles be less than 1/4 of the total span of the roof drains. Crickets must be behind all projections to prevent ponding. Roof saddles shall be used for drainage purposes only, and they shall not contribute to the average aged R-value. Fabricate with the following taper:
   a. Slope: ½ inch per foot.

B. Polyisocyanurate Board Insulation: 4' x 4' rigid cellular polyisocyanurate thermal insulation and meeting ASTM C 1289-01. LTTR R-values must be determined by C1289-01. The board shall be classified as follows:
   1. Facer Type: Type II, Class 1, felt or glass-fiber mat on both major surfaces.
   2. Grade: “Grade 3” i.e. compressive strength: 25 pounds per square inch.
   3. Curing Time: 24 hours minimum, plus an additional 24 hours minimum per inch of thickness at a minimum of 60 F before shipment from the manufacturer.
   4. One layer of 2.0-inch polyisocyanurate insulation on all areas

2.4 COVER BOARD

A. Cover Board: 5/8-inch 4’x4’ fiberglass faced gypsum board, Type X.

2.5 FASTENERS

A. Fasteners: A #15-13, buttress threaded, 3 phillips head fastener constructed of case hardened carbon steel with a reduced diameter drill point and corrosion resistant coating.

B. Barbed Stress Plates: Used to anchor membrane, are 2.5 inch x 1.5 inch rectangular in dimension with 0.75 inch radial corners, manufactured from 18 gauge AZ-50 galvalume steel with a 0.250 inch diameter hole in its center. The plate has a raised reinforcement area and "barbs".

C. Termination Bar: Membrane flashing(s) restraint / termination seals, nominal 1/8" x 1" x 10' 6060-T5 extruded aluminum bar with pre-punched slots, 8" o/c.

D. Insulation Adhesive:
   1. A two-component polyurethane adhesive used to adhere a variety of board stocks to most roof substrates.

2.8 AUXILIARY MATERIALS

A. A one-component gun-grade polyurethane sealant to seal flashing termination.

B. A one component pourable, self leveling, polyurethane sealant to fill "pitch pans".

C. Pre-Molded Flashing

D. Non-Reinforced Membrane - Field fabrication membrane, 0.060 mil non-reinforced EIP membrane. (For flashing transition and all T-joints).

E. Bonding Adhesive - A solvent based, contact type, (two sided) bonding adhesive, designed for bonding membrane to clean and dry, pre-approved horizontal or vertical substrates.

F. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time.

2.9 CONCRETE PATCH MATERIAL

A. Patch Material:
   1. Description: One-component magnesium phosphate-based patching and repair mortar; sets in approximately 15 minutes and takes rubber-tire traffic in 45 minutes. Use Set 45 Regular for ambient temperatures below 85° F (29° C) and Set 45 Hot Weather for ambient temperatures ranging from 85 to 100° F (29 to 38° C).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions under which roofing system will be applied, with Installer present, for compliance with requirements.

B. Verify that roof openings and penetrations are in place, set, and braced and that roof drains are replaced and properly clamped into position. Brace drains and drainpipes as necessary.

C. Verify that wood nailers are in place and secured and match thicknesses of insulation required. Note: ALL old nailers are to be removed and replaced and nailers must be added as required to match the new roof system elevation and for specified and manufacturer recommended installation to be complete and proper.

D. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove all existing roofing materials down to the deck.

B. Clean all substrates of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
   1. Removal of all preexisting materials, adhesives, foreign materials, debris and fasteners and full preparation to clean deck.

C. If the deck is damaged by removal of the existing roof materials including but not limited to cutting, ripping fasteners out, and/or gouging, the Contractor shall replace those deck sections at no cost to the COR in accordance with these specifications. Therefore, all existing fasteners are to be backed out and not pulled out of the deck.

D. Patch deteriorated concrete and fill all voids and joints in concrete decks with specified materials
   1. Use appropriate material, depending on ambient temperature.
   2. Ensure that moisture does not enter the building when repairing the concrete.
   3. Preparation:
      a. A sound substrate is essential for good repairs. Flush the area with clean water to remove all dust.
      b. Any surface carbonation in the repair area will inhibit chemical bonding. Apply a pH indicator to the prepared surface to test for carbonation.
      c. Air blast with oil-free compressed air to remove all water before placing Set 45.
   4. Mixing
      a. Set 45 must be mixed, placed, and finished within 10 minutes in normal temperatures (72° F [22° C]). Only mix quantities that can be placed in 10 minutes or less.
      b. Do not deviate from the following sequence; it is important for reducing mixing time and producing a consistent mix. Use a minimum 1/2" slow-speed drill and mixing paddle or an appropriately sized mortar mixer. Do not mix by hand.
      c. Pour clean (potable) water into mixer. Water content is critical. Use a maximum of 4 pts (1.9 L) of water per 50 lb (22.7 kg) bag of Set 45. Do not deviate from the recommended water content.

E. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast following roofing application. The old drains are to be removed and the new plaza deck drains need to be installed the same day and tied into the new membrane to ensure a weathertight installation the same working day. Make sure to remove the roof in a manner that all new roof application and all old roof that remains is able to completely drain each and every day.

F. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of the roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 INSULATION AND COVER BOARD INSTALLATION

A. Coordinate installation of roofing system components so that insulation is not exposed to precipitation or left exposed at the end of the workday. Any moisture that touches the insulation, including condensation or dew, will require that insulation to be discarded and removed from the job site.

B. Comply with roofing system manufacturer's written instructions for installing roof insulation.

C. Install at one layer of 2.0″ insulation. Insulation shall be installed staggering all from joints of previous layer a minimum of 6 inches in each direction.

D. Install tapered insulation to conform to slopes indicated and to Shop Drawings.

D. Install the insulation as necessary at roof drains to create a sump and so that the completed surface is flush and does not restrict flow of water.

E. Install cover board staggering all from joints of previous layer a minimum of 6 inches in each direction.

G. Adhered insulation:
1. The substrate must be free of any debris, dirt, oil, grease, and standing water before applying specified adhesive.
2. Apply fluid mixture in ¾ to 1 inch wide wet beads spaced maximum per the following on centers:
   a. Field - 4 beads 12″ o.c. held back 6″ from ends
   b. Perimeters - 12 feet wide - 7 beads 6″ o.c. held back 6″ from ends
   c. Corners - 12 feet wide - 11 beads 4″ o.c. held back 4″ from ends
   Adhesive is dispensed in bands. Information based on 4′ x 4′ board installation
3. All to spread in excess of 2 inches wide while rising ¾ to 1 inch.
4. Lay insulation board into place and walk-in to assure complete adhesion. Curing typically occurs in 4 to 8 minutes depending on temperature and weather conditions.

3.4 INSTALLATION OF MEMBRANE

A. Quality Control
1. It is the responsibility of the roofing contractor to initiate a Quality Control program to govern all aspects of the installation of the new Roofing System.
2. The job foreman and or supervisor will be responsible for the daily execution of the QC program which will include but is not limited to the supervision and inspection during substrate preparation, installation of separator boards, separator sheets, insulation, the application of adhesive(s), fasteners, ballast materials and probing of all heat welding incorporated within the roof system.

3. If any inconsistencies, in the over all quality of the installation, including but not limited to the quality of the welds, are found, all work shall cease until corrective actions are taken to insure the continuity of all workmanship.
4. A manufacturer’s technical representative must be on site for the first two full days of membrane installation and then periodically as required by the Manufacturer to ensure proper installation methods are being followed by the Installer.

B. General
1. Work shall be coordinated to ensure that sequencing of the installation promotes a 100% watertight installation at the end of each day.
2. All roofing systems or sections shall be designed utilizing and determined to be incompliance with the procedures outlined within the current publication of ASCE Standard 7. Alternative designs may be determined using the criteria within Factory Mutual Research Loss Prevention Data.
3. The roofing system may utilize either conventional "roll goods" or pre-fabricated custom rolls or a combination of both.
4. Restrictions regarding outside ambient air temperature are relative only to the exposure limits of the workers and/or adhesives.
5. When using adhesives, outside ambient air temperature should be above 40OF. Curing or drying time of the adhesive will be affected by ambient temperatures and must be taken into consideration when determining flashing lengths.
6. Roofing Systems shall only be installed over properly prepared and sound substrates, free from excessive surface roughness, dirt, debris and moisture.

C. Adhered Roofing Systems
1. Membrane Adhered with Bonding Adhesive
   a. Position the membrane and fold the sheet to allow a workable exposure of the underside of the sheet.
   b. Apply a 100% continuous coat of bonding adhesive to the exposed bottom side of the membrane and a mirrored area of the substrate.
   c. The amount of membrane and substrate that can be coated with adhesive will be determined by application method, ambient temperature, humidity and available manpower.
   d. Adhesive may be applied by spraying and “back” rolling or just rolling.
   e. Roller applied adhesive shall utilize a solvent resistant .375 inch nap roller, spreading the adhesive to ensure a smooth, even 100% coverage of the substrate and membrane.
   f. Spray applied adhesive must be spread out by roller to ensure a smooth, even 100% coverage of the substrate and membrane with no voids, skips, globs, puddles or similar irregularities.
      1. Note: A squeegee can be used to “flatten” or spread globs and puddles of adhesive.
   g. Adhesive coverage should average 100 sq. ft. per gallon of applied adhesive with a 50 sq. ft. per gallon net coverage (} 10%) for the membrane and substrate combined.
2. Allow the adhesive to dry to a point of being tacky, but not stringy to the touch on both surfaces. Do not allow adhesive to "dry out" on either surface.
3. When sufficiently dry, carefully maneuver the glued portion of the membrane onto the glued substrate surface, avoiding any wrinkles or air pockets.

4. Broom the adhered portion of the membrane to ensure full contact and complete the bonding process by firmly pressing the bonded membrane into place with a weighted, foam-covered, lawn roller.
5. Repeat the process for the remaining un-bonded portion of the membrane, lapping subsequent, adjacent rolls of membrane a minimum of 3 inches, ensuring proper shingling of the membrane to shed water along the laps.
6. No adhesive shall be applied to the lap "seam" areas of the membrane. Areas contaminated with adhesive are difficult to clean, will impair proper welding of the seams and require a membrane patch.
7. Do not use bad or marginal adhesives. Contact FTCS if the quality of the adhesive is suspect.

D. Hot Air Welding
   1. General
      a. All field seams exceeding 10 ft. in length shall be welded with a Manufacturer approved automatic welder.
      b. All field seams must be clean and dry prior to initiating any field welding.
      c. Remove foreign materials from the seams (dirt, oils, etc.) with Acetone, MEK, or approved alternative. Use CLEAN WHITE COTTON cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.
      d. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.
   2. Hand Welding
      a. The lap or seam area of the membrane should be intermittently tack welded to hold the membrane in place.
      b. The back "interior" edge of the membrane shall be welded first, with a continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
      c. The nozzle of the hand held hot air welder shall be inserted into the lap at a 45° angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be use to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1½'" wide nozzle, to create a homogeneous weld, a minimum of 1½" in width.
      d. Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 1" weld.
   3. Automatic Machine Welding
      a. Proper welding of the Membrane can be achieved with a variety of automatic welding equipment. Contact FTCS for specific recommendations.
      b. Follow all manufacturers’ instructions for the safe operation of the automatic welder.
      c. Follow local code requirements for electric supply, grounding, and surge protection.
      d. The use of a dedicated, portable generator is highly recommended to insure a consistent electrical supply, without fluctuations that can interfere with weld consistency.
      e. Properly welded seams shall utilize a 1½'" wide nozzle, to create a homogeneous weld, a minimum of 1½" in width.

E. Inspection
   1. The job foreman and/or supervisor shall initiate daily inspections of all completed work which shall include, but is not limited to the probing of all field welding with a dull pointed instrument to assure the quality of the application and insure that any equipment or operator deficiencies are immediately resolved. A Manufacturer's technical representative must be on site for the first two full days of membrane installation and then periodically as required by the Manufacturer to ensure proper installation methods are being followed by the Installer.
   2. Insure that all aspects of the installation (sheet layout, attachment, welding, flashing details, etc.) are in strict conformance with the most current Manufacturer's Specifications and Details.
   3. Excessive patching of field seams because of inexperienced or poor workmanship will not be accepted at time of final inspection for warranty acceptance, which will be determined by the COR at the COR's sole discretion.
   4. Any deviation from pre-approved specifications and/or details requires written authorization from the FTCS prior to application to avoid any warranty disqualification.

3.5 FLASHING

A. Clean all vents, pipes, conduits, tubes and stacks to bare metal. All protrusions must be properly secured to the roof deck with approved fasteners. Remove and discard all lead, pipes and drain flashing. New specified drains or drain inserts are to be installed Flash all penetrations according to Manufacturer and specified approved details.

B. Remove all cant strips and old existing flashing.

C. Flash all curbs, parapets and interior walls in strict accordance with approved details and the specification and drawing set.

D. All flashing shall be fully adhered to properly prepared, approved substrate(s), with specified adhesive applied in sufficient quantity to insure total adhesion.

E. The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond the fastener placement for membrane attachment to a width of 8 in.

F. Vertical flashing shall be terminated no less than 8 in. above the plane of the deck, or to the maximum height available in accordance with the detail which may verify lesser or greater than the 8", with approved termination bar and counter-flashing or metal cap flashing. Sealant is to be installed at the point of the termination bar and behind counterflashings or metal caps in a fashion that allows for a 100% application in sufficient quantity to ensure a full layer that will ooze out of the gap when the termination bar is fastened.

G. Complete all inside and outside corner flashing details with pre-formed corners or an approved field fabrication detail.

H. Probe all seams with a dull pointed probe to insure the weld has created a homogeneous bond. No patching of the flashing will be allowed; the installation of the flashing must be without fault.

I. Install penetration accessories in strict accordance with approved details. Insure penetration accessories have not impeded in any way the working specification. (Refer to the related trade for the technical specification).

3.6 SEALANTS

A. Apply authorized sealant(s) to all surface mounted reglets and where called for. Sealant(s) are to shed water, following manufacturer's instructions and installation guides.

B. Use primer when recommended by the manufacturer.

3.7 TEMPORARY SEALS

A. At the end of each working day or at the sign of rain, install temporary, 100% watertight seal(s) where the completed new roofing adjoins the existing roof surface. The tie-in’s will need to be to the deck and to the top of the existing roof system both to ensure that a complete weathertight seal is created.

B. The authorized roofing contractor shall create and maintain the temporary seal in such a manner to prevent water from traveling beneath the new and/or existing roof system.

C. The use of plastic roofing cement is permissible when sealing to an existing built up roof, but any contaminated membrane must be completely removed the next working day before work commences.

D. If water is allowed to enter beneath the newly completed roofing, the affected area(s) shall be removed and replaced at no additional expense to the Building Owner. This will occur weather the materials and/or area below the membrane appears to be affected by moisture or not.

E. Prior to the commencement of work, cut out and remove all contaminated membrane, insulation, roof cement or sealant and properly dispose of off site.

3.8 FIELD QUALITY CONTROL

A. Verify field strength of seams a minimum of twice daily, according to manufacturer's written instructions, and repair seam sample areas in a manner acceptable ascetically to the Consultant and COR, at their sole discretion.

B. A roof inspection is required by manufacturer before warranty issue. Prior to installing overburden, ensure that a manufacturer technician as probed and approved every square foot of membrane and every linear inch of seams.

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to the Consultant and the COR.

D. Notify Consultant and COR 48 hours in advance of the date and time of inspection.

3.9 PROTECTING AND CLEANING

A. Protect sheet membrane roofing from damage and wear during remainder of construction period. Do not traffic over or store any materials on completed roof areas.

B. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair sheet flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction daily, using cleaning agents and procedures required by manufacturer of affected construction.

- - - END - - -

SECTION 07 13 36
EIP COMPOSITE PRMA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. EIP sheet waterproofing.
   2. Extruded Insulation
   3. Composite PRMA Insulation Panel
   4. Drainage Board
   5. Protection sheet
   6. Slip sheet/filter fabric
   7. Separator board
   8. Deck restoration
   9. Concrete Pavers

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. All Divisions

C. Unit Prices: Refer to Division 1 Section "Unit Prices" for description of Work in this Section affected by unit prices.

D. Area of Work:
   1. Roof 3A
   2. Roof 3B

E. Scope of Work:
   1. Remove of all roof materials, etc., down to the concrete deck and properly dispose of offsite.
   2. Prepare and patch deteriorated concrete per specification.
   3. Install the new waterproofing system as designed. During installation termination bar and sealant must be installed every day when new materials are installed.
   4. System must be inspected by manufacturer’s non-sales technical representative, including the probing of all field and flashing seams, and also must pass manufacturer’s inspection prior to installation of overburden.
   5. The installed roof system Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 28 years and who has experience with observing EIP Composite PRMA roof installations within the past 24 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

6. No materials or human traffic may occur over installed membrane except for the installation of the insulation, pavers, and associated sheet metal components. Further, no storing of materials will be permitted on the installed membrane. This means the contractor needs to sequence the roof installation to ensure the membrane or finished roof system does not get trafficked when doing the next roof area, for both roof removal debris and new product delivery and installation.

C. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.

D. Shop Drawings: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

E. Samples: For the following products:
1. Concrete roof paver, full sized, in each color and texture required.
2. Ballast in specified size and type.

F. Sample Warranty: Copy of special waterproofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions before starting waterproofing.

1.3 QUALITY ASSURANCE

A. The EIP membrane waterproofing system must achieve a UL Class A and/or FM 1-90 rating.

B. Manufacturer Qualifications: Membrane must have been designed and manufactured solely by the company, without formulation or reinforcement change and without change in company ownership and name, for the past 20 consecutive years.

C. Unless otherwise noted in this specification, the roofing Contractor shall strictly comply with the manufacturer's current specifications and details.

D. Installer Qualifications: The Installer must have completed work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance for at least one (1) project of similar scope in the last three (3) years. In addition, said Contractor must be in a solvent financial condition for the past two (2) consecutive years. The Contractor will need to prove they are approved and authorized by the Manufacturer to install the roof system for the specified warranty.

E. Provide adequate number of experienced workers regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.

F. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the Consult-

ant. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the Consultant's consideration.

G. The Contractor shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer for the first 2 full days of membrane and flashing installation and then periodically as required by the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building COR seventy-two (72) hours prior to the manufacturer's final inspection. System must be inspected by manufacturer’s non-sales technical representative, including the probing of ALL field and flashing seams, and also must pass manufacturer’s inspection prior to installation of overburden.

H. Fire-Test-Response Characteristics: Provide roofing materials with the fire test response characteristics indicated as determined by testing identical products per test method indicated below by UL, FM, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and slopes indicated.
   2. Fire-Resistant Ratings: ASTM E119, for fire-resistance, rated roof assemblies applicable to this system.

I. Preinstallation Conference: Before installing roofing system, conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings”. Notify participants at least 5 working days before conference.
   1. Meet with COR; Consultant; COR's insurer, if applicable, roofing Installer; roofing system manufacturer's representative; deck Installer; and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   3. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
   4. Review governing regulations and requirements for insurance, certificates, and inspection and testing, if applicable.
   5. Review temporary protection requirements for roofing system during and after installation.
   6. Review roof observation and repair procedures after roofing installation.
   7. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

J. The manufacturer must have a technical representative on site to observe the membrane and flashing installation for a minimum of the first 2 days during the installation of the membrane and flashing, and then periodically as required by the manufacturer; and all seams will be inspected by technician prior to overburden installation. Note that the technical representative does not need to be onsite during the removal of existing roof materials. Additionally, the Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP COMPOSITE PRMA roof installations within the past 36 months, to observe all of the prime contractor's work for all technical divisions of the project on a full time basis each and every day the contractors are on site.

K. Inspections
   1. The Composite PRMA and membrane manufacturer representative must be informed by the roofing contractor sufficiently in advance of the prejob conference and of when any roofing work will commence so that the job may be reviewed in advance, prejob conferences attended, and appropriate inspections scheduled.

L. Deviations from Specification
   1. There shall be no deviation made from COMPOSITE PRMA or Membrane Manufacturer specifications without prior written approval by Composite PRMA or Membrane Manufacturer and the COR.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, warm, well-ventilated, weather-tight location according to roofing system manufacturer's written instructions. Store rolls of felt and other sheet materials on end on pallets or other raised surfaces. Do not double-stack rolls.
   1. Handle and store roofing materials and place equipment in a manner to avoid significant or permanent deck or structural supporting members.

B. Do not leave unused felts and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 deg F (10 deg C).

C. Deliver and store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

D. Protect roofing insulation and decking materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

E. If tarps are used to protect materials, the tarpaulins must be non-sweating and secured to the materials in a non-destructive manner and must drape onto the ground or roof surface.

F. No materials can be exposed to the elements. If materials are found to be or have been exposed to the elements, they will be considered damaged. Any damaged materials cannot be used and must be immediately removed from the site.

G. All packaging materials, i.e. shrink-wrap, must be removed from all insulation materials prior to cover the materials with tarpaulins. The contractor must then secure all materials to ensure that no materials become a safety issue.

H. No materials can be stored on the finished roof or adjoining roofing systems which are under warranty without prior approval of the COR and the use of protection consisting of, at a minimum, .5 inch plywood and 1.5 inch polyisocyanurate insulation banded together.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Apply waterproofing within range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
   1. Do not apply waterproofing in snow, rain, fog, or mist.

B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.6 WARRANTY

A. Manufacturer's Warranty: The Contractor shall obtain the Composite PRMA manufacturer’s written warranty covering the entire roofing system for 20-years and from wind damage for up to 80-mph winds, including overburden removal and replacement without charge to the Owner. The Contractor shall also obtain the waterproofing manufacturer’s 20-year written warranty, agreeing to repair or replace waterproofing that does not comply with requirements and/or that does not remain watertight within specified warranty period, with the provision for removal and replacement of all overburden to repair leaks and/or problems with the installed roof system.
   1. Warranty Period: 20 years after date of Substantial Completion.
   2. Composite PRMA manufacturer’s warranty shall include removal and replacement of all overburden when repairing any leaks without cost to Owner.
   3. A wind guaranty up to 80-mph.

B. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and/or faulty workmanship and/or materials. Guaranty shall include removal and replacement of all overburden when repairing any leaks without cost to the Owner. All costs for any warranties and guaranties in paragraphs A and B shall be paid by the Contractor and material manufacturer.

C. Warranties and guarantees must be submitted before retainage will be released.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the following products:
   1. Membrane:
      a. EIP
   2. Extruded polystyrene insulation:
      a. As approved and supplied through Manufacturer
   3. Composite Protected Membrane Roof Insulation Panels
   4. Fasteners
      a. Manufacturers approved
   5. Drainage Panels
   6. Concrete Patch Material
   7. Slip Sheet
   8. Concrete Pavers

2.2 SHEET WATERPROOFING

A. Approved Membranes:
   1. Polyvinyl Chloride, 80 mil, thermoplastic waterproofing membrane meeting or exceeding ASTM D4434, Type III performance standards and containing KEE (Ketone ethylene ester)
   2. Polyvinyl Chloride, 60 mil, thermoplastic waterproofing membrane meeting or exceeding ASTM D6754 performance standards and containing KEE (Ketone ethylene ester)

B. Flashing Membrane:
   1. Polyvinyl Chloride, 60 mil, thermoplastic waterproofing membrane meeting or exceeding ASTM D4434, Type III or ASTM D6754 performance standards and containing KEE (Ketone ethylene ester)

2.3 EXTRUDED POLYSTYRENE INSULATION

A. Board Insulation: Extruded-polystyrene board insulation complying with ASTM C 578, drainage edges on all four sides of bottom of panel; of type, density, and compressive strength indicated below:
   1. Type VII, 2.2-lb/cu. ft. (35-kg/cu. m) minimum density and 25-psi (278-kPa) minimum compressive strength.
   2. Board Dimension: 4’ x 8’
   3. Note one layer of 3 inch layer of insulation shall be installed on the entire roof area.

2.4 COMPOSITE PROTECTED MEMBRANE ROOF (COMPOSITE PRMA) INSULATION PANELS

A. Cementitious Surfaced Foam Insulation
   1. The Composite PRMA shall be:
      a. Latex Modified Concrete Face: 15/16”
      b. The size shall be 24 in. x 48 in. x 2-inches (foam thickness) in thickness to achieve the desired U-factor through the complete roof system.

c. The foam component of the Composite PRMA panels shall have the following physical properties:
   i. Typical 5-year aged R-value of 5.0 per sq. ft.-h-°F/Btu per in. of thickness when tested at 75°F mean t e m p e r a t u r e in accordance with ASTM C 518-76.
   ii. Minimum compressive strength of the foam insulation shall be 40 lbs. per sq. in. when tested in the vertical direction (at 10% deformation or yield, whichever occurs first) in accordance with ASTM D 1621-73.
   iii. The foam insulation component shall meet the physical property requirements given in ASTM specification C 578-85, Type VI.

2. The composite insulation shall have the following properties:
   a. Withstand freeze/thaw conditioning for a minimum of 750 freeze/thaw cycles in accordance with ASTM C 666 procedure B.
   b. Minimum weight of 11 lbs. per sq. ft.

B. Factory Fabricated Perimeter Metal Securement
   1. L-shape perimeter securement shall be approved by Manufacturer
   2. J-shape perimeter securement shall be approved by Manufacturer

C. Field and Shop Fabricated Metal Securement
   1. Counter flashing/gravel stop perimeter metal securement detail must be fabricated to extend a minimum of 6 in. onto the surface of the Composite PRMA Insulation panels and meet all material requirements stated in this section.
   2. Metal securement shall be minimum 22 ga. (0.0284-0.0314) ASTM grade 304 stainless steel.
   3. Metal securement shall have a maximum continuous length of 12 ft. A longitudinal crimp or break in the metal securement is recommended to achieve stiffening.

D. Fasteners
   1. Fasteners for metal attachment to COMPOSITE PRMA Insulation panels shall be approved by the Manufacturer.
   2. Fasteners for attachment of metal securement to structure shall be approved by the Manufacturer.
   3. Nails not acceptable

2.5 SEPARATOR BOARD

A. Separator Board: ¼-inch 4’x8’ closed cell polyisocyanurate foam board with clay coated fiber glass facer over metal decks prior to membrane installation.

2.6 MOLDED-SHEET DRAINAGE PANELS

A. Molded-Sheet Drainage Panel: Prefabricated, composite drainage panels, manufactured with a permeable geotextile facing laminated to a molded-plastic-sheet drainage core.
   1. Drainage Core: Three-dimensional, non-biodegradable, molded-plastic-sheet material designed to effectively drain water under backfill pressure; complying with the following properties determined according to tests indicated:
      a. Compressive Strength: 18,000 lbf/sq. ft. (862 kPa), minimum; ASTM D 1621.
      b. Flow Rate: 1.34 gpm/ft, minimum, at hydraulic gradient of 0.1; ASTM D 4716.

c. Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with the following properties determined according to AASHTO M 288:
   1. Survivability: Class 2.
   2. Apparent Opening Size: No. 40 (0.43-mm) sieve, maximum.
   3. Permittivity: 0.5 per second, minimum.

2.7 FASTENERS

A. Fasteners: A #15-13, buttress threaded, 3 phillips head fastener constructed of case hardened carbon steel with a reduced diameter drill point and corrosion resistant coating.

B. Barbed Stress Plates: Used to anchor membrane, are 2.5 inch x 1.5 inch rectangular in dimension with 0.75 inch radial corners, manufactured from 18 gauge AZ-50 galvalume steel with a 0.250 inch diameter hole in its center. The plate has a raised reinforcement area and "barbs".

C. Termination Bar: Membrane flashing(s) restraint / termination seals, nominal 1/8" x 1" x 10' 6060-T5 extruded aluminum bar with pre-punched slots, 8" o/c.

2.8 AUXILIARY MATERIALS

A. A one-component gun-grade polyurethane sealant to seal flashing termination.

B. A one component pourable, self leveling, polyurethane sealant to fill "pitch pans".

C. Pre-Molded Flashing

D. Non-Reinforced Membrane - Field fabrication membrane, 0.060 mil non-reinforced EIP membrane. (For flashing transition and all T-joints).

E. Bonding Adhesive - A solvent based, contact type, (two sided) bonding adhesive, designed for bonding membrane to clean and dry, pre-approved horizontal or vertical substrates.

F. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time.

2.9 CONCRETE PATCH MATERIAL

A. Patch Material:
   1. Description: One-component magnesium phosphate-based patching and repair mortar; sets in approximately 15 minutes and takes rubber-tire traffic in 45 minutes. Use Set 45 Regular for ambi-

ent temperatures below 85° F (29° C) and Set 45 Hot Weather for ambient temperatures ranging from 85 to 100° F (29 to 38° C).

2.10 CONCRETE PAVERS

D. Roof Pavers: Heavyweight, factory-cast, square-edged, concrete units; specially manufactured for use as roof ballast, and as follows:
   1. Weight: 18 lb. / sq. ft. (90 kg/sq. m), minimum.
   2. Compressive Strength: 5000 psi (34 MPa), minimum.
   3 Minimum thickness: 1-7/8 inch (48 mm).
   4 Size: 24 by 24 inches (600 by 600 mm).
   5. Color and Texture: Provide Owner with selections from manufacturer's full range of colors and textures for materials and products of type indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions under which roofing system will be applied, with Installer present, for compliance with requirements.

B. Verify that roof openings and penetrations are in place, set, and braced and that roof drains are replaced and properly clamped into position. Brace drains and drainpipes as necessary.

C. Verify that wood nailers are in place and secured and match thicknesses of insulation required. Note: ALL old nailers are to be removed and replaced and nailers must be added as required to match the new roof system elevation and for specified and manufacturer recommended installation to be complete and proper.

D. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove all existing roofing materials down to the deck.

B. Clean all substrates of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
   1. Removal of all preexisting materials, adhesives, foreign materials, debris and fasteners and full preparation to clean deck.

C. If the deck is damaged by removal of the existing roof materials including but not limited to cutting, ripping fasteners out, and/or gouging, the Contractor shall replace those deck sections at no cost to the COR in accordance with these specifications. Therefore, all existing fasteners are to be backed out and not pulled out of the deck.

D. Patch deteriorated concrete and fill all voids and joints in concrete decks with specified materials
   1. Use appropriate material, depending on ambient temperature.
   2. Ensure that moisture does not enter the building when repairing the concrete.
   3. Preparation:
      a. A sound substrate is essential for good repairs. Flush the area with clean water to remove all dust.
      b. Any surface carbonation in the repair area will inhibit chemical bonding. Apply a pH indicator to the prepared surface to test for carbonation.
      c. Air blast with oil-free compressed air to remove all water before placing Set 45.
   4. Mixing
      a. Set 45 must be mixed, placed, and finished within 10 minutes in normal temperatures (72° F [22° C]). Only mix quantities that can be placed in 10 minutes or less.
      b. Do not deviate from the following sequence; it is important for reducing mixing time and producing a consistent mix. Use a minimum 1/2" slow-speed drill and mixing paddle or an appropriately sized mortar mixer. Do not mix by hand.
      c. Pour clean (potable) water into mixer. Water content is critical. Use a maximum of 4 pts (1.9 L) of water per 50 lb (22.7 kg) bag of Set 45. Do not deviate from the recommended water content.

E. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast following roofing application. The old drains are to be removed and the new plaza deck drains need to be installed the same day and tied into the new membrane to ensure a weathertight installation the same working day. Make sure to remove the roof in a manner that all new roof application and all old roof that remains is able to completely drain each and every day.

F. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of the roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 SEPARATOR BOARD INSTALLATION

A. Coordinate installing roofing system components so separator board is not exposed to precipitation or left exposed at the end of the workday.

B. Install the ¼-inch board over the deck area loose laid with no gaps between boards, staggered center of the board fashion.

3.4 INSTALLATION OF MEMBRANE

A. Quality Control
   1. It is the responsibility of the roofing contractor to initiate a Quality Control program to govern all aspects of the installation of the new Roofing System.

2. The job foreman and or supervisor will be responsible for the daily execution of the QC program which will include but is not limited to the supervision and inspection during substrate preparation, installation of separator boards, separator sheets, insulation, the application of adhesive(s), fasteners, ballast materials and probing of all heat welding incorporated within the roof system.
3. If any inconsistencies, in the over all quality of the installation, including but not limited to the quality of the welds, are found, all work shall cease until corrective actions are taken to insure the continuity of all workmanship.
4. A manufacturer's technical representative must be on site for the first two full days of membrane installation and then periodically as required by the Manufacturer to ensure proper installation methods are being followed by the Installer.

B. General
1. All work shall be coordinated to insure that the sequencing of the installation will allow for a 100% watertight installation at the end of each work day.
2. Ballasted Roofing Systems shall utilize pre-fabricated, non-tabbed custom rolls.

C. Membrane
1. Unroll and position the membrane onto the properly prepared substrate, separator sheet or separator board.
2. Install the membrane in a flat, relaxed position avoiding wrinkles and stretching. If the membrane does not lay flat without wrinkles it is to be discarded and not installed.
3. Adjoining rolls shall overlap a minimum of four (4) inches, properly shingled with the flow of water wherever possible.
4. Stager the factory seams to prevent adjacent factory welds from falling on top of one another.
5. The field membrane shall be properly affixed to the deck or restrained in an approved manner at all roof perimeters, walls, expansion joints, curbs and penetrations having any one dimension greater than 24 inches in length. (See Current Manufacturer Construction Details)

D. Hot Air Welding
1. General
   a. All field seams exceeding 10 ft. in length shall be welded with a Manufacturer approved automatic welder.
   b. All field seams must be clean and dry prior to initiating any field welding.
   c. Remove foreign materials from the seams (dirt, oils, etc.) with Acetone, MEK, or approved alternative. Use CLEAN WHITE COTTON cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.
   d. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.
2. Hand Welding
   a. The lap or seam area of the membrane should be intermittently tack welded to hold the membrane in place.
   b. The back "interior" edge of the membrane shall be welded first, with a continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
   c. The nozzle of the hand held hot air welder shall be inserted into the lap at a 45° angle to the lap. Once the polymer on the material

begins to flow, a hand roller shall be use to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1½'" wide nozzle, to create a homogeneous weld, a minimum of 1½" in width.

d. Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 1" weld.

3. Automatic Machine Welding
   a. Proper welding of the Membrane can be achieved with a variety of automatic welding equipment. Contact FTCS for specific recommendations.
   b. Follow all manufacturers' instructions for the safe operation of the automatic welder.
   c. Follow local code requirements for electric supply, grounding, and surge protection.
   d. The use of a dedicated, portable generator is highly recommended to insure a consistent electrical supply, without fluctuations that can interfere with weld consistency.
   e. Properly welded seams shall utilize a 1½'" wide nozzle, to create a homogeneous weld, a minimum of 1½" in width.
4. Add one foot wide membrane striping cover sheet over all membrane field seams.
   a. Add a one foot wide strip of membrane as a cover flashing over all field seams and continue the strip membrane flashing up the vertical flashing to the top of the overburden of the roof system. Heat weld the membrane strip flashing following the same procedures as was used for the membrane installation. Insure the foreman and manufacturers' technical representatives check all seams before installing the strip flashing and check all seams of the strip flashing after its installation.

E. Inspection
1. The job foreman and/or supervisor shall initiate daily inspections of all completed work which shall include, but is not limited to the probing of all field welding with a dull pointed instrument to assure the quality of the application and insure that any equipment or operator deficiencies are immediately resolved. A Manufacturer's technical representative must be on site for the first two full days of membrane installation and then periodically as required by the Manufacturer to ensure proper installation methods are being followed by the Installer.
2. Insure that all aspects of the installation (sheet layout, attachment, welding, flashing details, etc.) are in strict conformance with the most current Manufacturer's Specifications and Details.
3. Excessive patching of field seams because of inexperienced or poor workmanship will not be accepted at time of final inspection for warranty acceptance, which will be determined by the COR at the COR's sole discretion.
4. Any deviation from pre-approved specifications and/or details requires written authorization from the FTCS prior to application to avoid any warranty disqualification.

3.5 FLASHING

A. Clean all vents, pipes, conduits, tubes and stacks to bare metal. All protrusions must be properly secured to the roof deck with approved fasteners. Remove and discard all lead, pipes and drain flashing. New specified drains or drain inserts are to be installed Flash all penetrations according to Manufacturer and specified approved details.

B. Remove all cant strips and old existing flashing.

C. Flash all curbs, parapets and interior walls in strict accordance with approved details and the specification and drawing set.

D. All flashing shall be fully adhered to properly prepared, approved substrate(s), with specified adhesive applied in sufficient quantity to insure total adhesion.

E. The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond the fastener placement for membrane attachment to a width of 8 in.

F. Vertical flashing shall be terminated no less than 8 in. above the plane of the deck, or to the maximum height available in accordance with the detail which may verify lesser or greater than the 8”, with approved termination bar and counter-flashing or metal cap flashing. Sealant is to be installed at the point of the termination bar and behind counterflashings or metal caps in a fashion that allows for a 100% application in sufficient quantity to ensure a full layer that will ooze out of the gap when the termination bar is fastened.

G. Complete all inside and outside corner flashing details with pre-formed corners or an approved field fabrication detail.

H. Probe all seams with a dull pointed probe to insure the weld has created a homogeneous bond. No patching of the flashing will be allowed; the installation of the flashing must be without fault.

I. Install penetration accessories in strict accordance with approved details. Insure penetration accessories have not impeded in any way the working specification. (Refer to the related trade for the technical specification).

3.6 ROOF DRAIN INSERTS

A. Flash all roof drain inserts in accordance with Manufacturer and specified roof drain insert details.

3.7 EXPANSION JOINTS

A. Flash all expansion joints in accordance with authorized and specified details. Fasten all expansion joint material according to the manufacturer’s specifications. Insure the expansion material has sufficient material to expand to the widest point in expansion without causing undue stress on the expansion joint material.

3.8 SEALANTS

A. Apply authorized sealant(s) to all surface mounted reglets and where called for. Sealant(s) are to shed water, following manufacturer's instructions and installation guides.

B. Use primer when recommended by the manufacturer.

3.9 MODELED SHEET DRAINAGE PANELS

A. Completely clean installed membrane of all dirt and debris.

B. Lay drainage panels directly over the waterproofing membrane protection layer(s). Start at the low points (drains) of the deck and shingle all laps to the flow of water.

B. Splice panels together by butting longitudinal edges of adjacent sheets and install 12” wide filter fabric over splice and secure with waterproof fabric tape.

C. Neatly trim drainage panels to fit closely around the base of all roof drain perimeter to ensure that water will flow freely from panels into drain openings. Cut the core around penetrations, and cut an “X” in the filter fabric and tape the fabric to the sides of the penetration.

D. Cover all cut edges of the drainage composite with an integral fabric flap by tucking the fabric around the edge of the core and adhering the fabric to the bottom of the core.

E. Proceed with installation of insulation (if specified) promptly; do not leave filter fabric or panel exposed to direct sunlight for more than one week.

3.10 INSULATION INSTALLATION

A. Insulation shall be installed according to the insulation manufacturer’s recommendations.

B. Install one layers of 3” thick specified board insulation over waterproofed surfaces. Cut and fit to within ½-inch of projections and penetrations.

C. Insulation shall be laid over drainage mat in parallel courses with end joints staggered, tightly butted. Stagger boards center board and ensure staggering of the top layer is center board from the bottom staggered installation.

D. On horizontal surfaces, loosely lay insulation units in parallel courses according to manufacturer's written instructions. Stagger end joints and tightly abut insulation.

E. Insulation shall be neatly cut to fit around penetrations and projections.

F. Do not install more insulation than cannot be covered by overburden by the end of the day.

G. All foam exposed directly to the sun shall be coated with exterior grade latex paint or otherwise protected.

3.11 COMPOSITE PROTECTED MEMBRANE ROOF (COMPOSITE PRMA) INSULATION PANELS

A. Multi-layer Installations of Extruded Polystyrene and Composite PRMA Insulation
   1. Layer(s) of insulation underlaying the Composite PRMA Insulation panels must be extruded polystyrene with a minimum compressive strength of 40 lbs. per sq. in.
   2. The lower layer must be equal to or thicker than the thickness of the Composite PRMA Insulation panels.
   3. All joints shall be staggered in relation to other layer(s).
   4. All layers shall be installed unadhered.

B. Composite PRMA Insulation Panels Installation
   1. Commencing installation of Composite PRMA Insulation panels.
      a. Always start at a corner close to the source of the prevailing wind. Work from the bottom of slope to the top.
      b. Start the first row with a whole board at a corner with groove side towards the edge of the roof. Snap a chalk line the width of one board (2 ft.) away from the perimeter edge as a guide. Lay the boards tightly in the row.
      c. To obtain a stagger, the second row of boards should begin with a half board. Two additional chalk lines at 90 degree angles to the first at 4 ft. and 6 ft. away from the perimeter edge should be snapped to help maintain end stagger by indicating starter lines for the ends of the first boards in the next rows.
      d. Once the array is started it must be continued across the entire roof area.
      e. Insulation boards shall be cut using masonry saw blades.
   2. General Placement of Insulation Boards.
      a. Tight tongue and groove integrity (with no gaps greater than 1/4 in.) and a staggered-joint array must be maintained.
      b. Boards must remain unadhered to the membrane.
      c. All sides of the boards must be tightly butted to the adjacent boards.
      d. The concrete mortar surface on the boards must not be in contact with terminations such as parapets, curbs, etc. Use of 1/2 in. thick polyethylene foam is suggested.
      e. Boards shall be laid with 4 ft. long side in the direction of the roof slope. Array should begin at the bottom of steep roof slopes and be continued to the roof peak. This is most critical for roof slopes greater than 1/2 / 12.
   3. Placing Insulation Boards Across Slope Changes
      a. Insulation units shall be cut to conform to slope changes on the deck and to prevent breakage of boards spanning across slope changes.
      b. Additional securement must be added if tongue and groove or staggered joint array is compromised or if boards are cut to lay flat on adjacent planes.
      c. Small cut pieces must not be used in the system where a full board or a larger piece can be used.
   4. Terminations

a. Panels must be tightly fitted and no more than a maximum of 1/2 in. from all terminations or penetrations. The insulation may be beveled to conform to the slope of cant strips.
b. Boards must be terminated immediately adjacent to drain bonnet.
c. Perimeter terminations
   i. Long-Edge Termination: Perimeter termination method when 4 ft. long edge of board is against the perimeter. Pieces with width equal to or greater than 6 in. must be placed into position with tongue and groove integrity. For terminating pieces less than 6 in. wide, tongue and groove is not required.
   ii. Short-Edge Termination: Perimeter termination method when 2 ft. long edge of board is against the perimeter. Boards ending a row with lengths less than 6 in. may be moved into the array of the roof as the second board from the perimeter.
d. All foam exposed to the sun shall be coated with exterior grade latex paint or otherwise protected.

C. Mechanical Perimeter Securement
1. Metal Perimeter Edge Securement
   a. Metal counter flashing/gravel stop securement. The metal counter flashing/gravel stop securement shall extend a minimum of 6 in. onto the surface of the heavy duty Composite PRMA Insulation panel and be attached 18 in. on center using approved fasteners. Fasteners must be 3 in. minimum from any board edge.
   b. Factory prefabricated metal counter flashing/gravel stop securement. Install L-shape or J-shape metal securement in accordance with the manufacturer’s instructions
2. The metal perimeter edge securement shall be securely attached to the perimeter edge wood nailer or wall a maximum of 12 in. on center using appropriate fasteners, providing minimum 200 lb. pull resistance.
3. The metal perimeter edge securement shall not run for continuous lengths over 12 ft. Proper considerations for coefficient of expansion/contraction and corrosion must be incorporated in the design of the metal and fasteners.
4. The metal perimeter edge securement must be attached to a terminating board that has tongue and groove integrity and is equal to or greater than 6 in. wide. If the termination board is less than 6 in. wide, the metal perimeter securement must be extended a minimum of 6 in. onto the surface of the next whole board in and be attached a maximum of 18 in. on center.
5. When perimeter drainage is used (i.e. gutter edge detail) the perimeter securement must be perforated and constructed from minimum 18 gauge stainless steel.

D. Ballasted Perimeter Securement
1. Ensure Composite PRMA Insulation Panels and properly install and their surface is clean of all foreign materials.
2. Install a single wide row of pavers at the perimeter of the roof where mechanically means of attachment is not permitted. Reference the roof plans and details for locations.

E. Securement Where Tongue and Groove Integrity Has Been Lost
1. Interruptions in Tongue and Groove Integrity

a. Wherever tongue and groove integrity is lost or cuts are made through the boards, securement shall be added to tie the system together using:
   i. A metal strap, 8 in. wide minimum, centered on the break and fastened on both edges, 12 in. on center. The strap must extend a minimum of 4 in. onto the face of the board and the fasteners must be a minimum of 3 in. from edges.

2. Internal Penetrations
   a. All penetrations greater than 4 ft., but less than 12 ft. in any direction shall be secured with minimum 3 in. wide, 22 gauge metal strap secured a maximum of 12 in. on center.
   b. Internal penetrations greater than or equal to 12 ft. in any direction must be secured in the same manner as the perimeter.

F. Fasteners
   1. Installation of Fasteners
      a. All fastener manufacturers installation specifications must be followed.
      b. Fasteners must be placed in a predrilled hole when installed into the heavy duty Composite PRMA Insulation panels, with the hole size specified by the fastener manufacturer. Hammer type drills must not be used in drilling the holes.
      c. Fasteners must not be overdriven and must be perpendicular to the appropriate plane.
      d. Correct drill bits and tools as recommended by the product manufacturer shall be used to ensure proper fastener installation.
      e. Fasteners shall be placed a maximum of 18 in. on center for attaching perimeter edge securement and a maximum of 1 ft. on center for attaching securement where tongue and groove integrity has been lost. Fasteners shall be placed a minimum of 3 in. from any of the insulation board edges.

3.12 TEMPORARY SEALS

A. At the end of each working day or at the sign of rain, install temporary, 100% watertight seal(s) where the completed new roofing adjoins the existing roof surface. The tie-in’s will need to be to the deck and to the top of the existing roof system both to ensure that a complete weathertight seal is created.

B. The authorized roofing contractor shall create and maintain the temporary seal in such a manner to prevent water from traveling beneath the new and/or existing roof system.

C. The use of plastic roofing cement is permissible when sealing to an existing built up roof, but any contaminated membrane must be completely removed the next working day before work commences.

D. If water is allowed to enter beneath the newly completed roofing, the affected area(s) shall be removed and replaced at no additional expense to the Building Owner. This will occur weather the materials and/or area below the membrane appears to be affected by moisture or not.

E. Prior to the commencement of work, cut out and remove all contaminated membrane, insulation, roof cement or sealant and properly dispose of off site.

3.13 FIELD QUALITY CONTROL

A. Verify field strength of seams a minimum of twice daily, according to manufacturer's written instructions, and repair seam sample areas in a manner acceptable ascetically to the Consultant and COR, at their sole discretion.

B. A roof inspection is required by manufacturer before warranty issue. Prior to installing overburden, ensure that a manufacturer technician as probed and approved every square foot of membrane and every linear inch of seams.

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to the Consultant and the COR.

D. Notify Consultant and COR 48 hours in advance of the date and time of inspection.

3.14 PROTECTING AND CLEANING

A. Protect sheet membrane roofing from damage and wear during remainder of construction period. Do not traffic over or store any materials on completed roof areas.

B. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair sheet flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction daily, using cleaning agents and procedures required by manufacturer of affected construction.

- - - END - - -

SECTION 07 19 00
WATER REPELLENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes clear water-repellent coatings for the following vertical surfaces:
   1. Brick masonry components.

B. Areas of Work:
   1. Clay Brick Masonry Wall sections above:
      a. Roof 3A
      b. Roof 3B

C. Scope of Work:
   1. Perform all applicable and specified tests and report results within 48 hours in writing to the consultant. This includes a pre-test by the manufacturer’s representative and a post-test by the manufacturer’s representative.
   2. Apply water repellant according to manufacturer’s acquirements and the requirements of this specification. Apply the specified Silane to all the brick masonry components.

1.3 PERFORMANCE REQUIREMENTS

A. Provide water repellents with the following properties based on testing manufacturer’s standard products according to test methods indicated, applied to substrates simulating Project conditions using same materials and application methods to be used for Project.

B. Absorption: Minimum 90 percent reduction of absorption after 24 hours in comparison of treated and untreated specimen.
   1. Brick: ASTM C 67.

C. Water-Vapor Transmission: Maximum 10 percent reduction in rate of vapor transmission in comparison of treated and untreated specimens, per ASTM E 96.

D. Water Penetration and Leakage through Masonry: Maximum 90 percent reduction in leakage rate in comparison of treated and untreated specimens, per ASTM E 514.

E. Durability: Maximum 5 percent loss of water repellence after 2500 hours of weathering in comparison to specimens before weather, per ASTM G 53.

F. Permeability: Minimum 80 percent breathable in comparison of treated and untreated specimens, per ASTM D 1653.

1.4 SUBMITTALS

A. Product Data and Material Safety Data: Include manufacturer's specifications, surface preparation, and application instructions, recommendations for water repellents for each surface to be treated, and protection and cleaning instructions. Include data substantiating that materials are recommended by manufacturer for applications indicated and comply with requirements.

B. Applicator Certificates: Signed by manufacturer certifying that the applicator complies with requirements.

C. Certification by water repellent manufacturer that products supplied complies with local regulations controlling use of VOC's.

D. Material Test Reports: Indicate and interpret test results for compliance of water repellents with requirements indicated.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: The applicator that employs only persons trained and approved by water repellent manufacturer for application of manufacturer's products and has been approved for at least the last five consecutive years.

B. Testing Agency Qualifications: An independent testing agency with experienced and capability to conduct testing indicated in "Performance Requirements" Article without delaying the Work, per ASTM E 548.

C. Regulatory Requirements: Comply with applicable rules of the pollution-control regulatory agency having jurisdiction in Project locale regarding VOC's and use of hydrocarbon solvents.

D. Field Samples: Consultant will select one representative surface for each substrate to receive water repellents. Apply water repellent to each substrate, with either partial or full coverage as directed. Comply with application requirements of this Section.
   1. Obtain Consultant's approval of field samples before applying water repellents.
   2. Maintain field samples during construction in an undisturbed condition as a standard for judging the completed Work.

E. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor's work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.6 PROJECT CONDITIONS

A. Weather and Substrate Conditions: Do not proceed with application of water repellent under any of the following conditions, except with written instruction of manufacturer:
   1. Ambient temperature is less than 40^{0}F.
   2. Concrete surfaces and mortar have cured for less than 28 days.
   3. Rain or temperatures below 40 ^{0}F are predicted within 24 hours.
   4. Application is earlier than 24 hours after surfaces have been wet.
   5. Substrate is frozen or surface temperature is less than 40°F.
   6. Windy condition exists that may cause water repellent to be blown

onto vegetation or surfaces not intended to be coated.

1.7 WARRANTY/GUARANTEE

A. General Warranty: Submit a written warranty, executed by the applicator and water repellent manufacturer, covering materials and labor, agreeing to repair or replace materials that fail to provide water repellence within the specified warranty period.
   1. Loss of water repellency:
      a. Brick Masonry: 1.0 mil/20 minutes or greater (80 mph wind driven rain equivalent).
   2. Warranty Period: Ten (10) years from date of Project Closeout.

B. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

C. All warranties and guarantees must be submitted before retainage will be released.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the following:
   6. Silane

2.2 WATER REPELLENTS

A. Silane, Penetrating Water Repellent: Clear, 100% pure silane with 400 g/L or less of VOCs.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrate of substances that might interfere with penetration or performance of water repellents. Test for moisture content, according to repellent manufacturer's written instructions, to ensure surface is sufficiently dry.
   1. Clay Brick Masonry: Clean clay brick masonry per ASTM D 5703.

B. Test for pH level, according to repellent manufacturer's instructions to ensure chemical bond to silicates minerals.

C. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of the water repellent being deposited on surfaces. Cover live plants and grass.

D. Coordination with Sealant: Do not apply water repellent until sealant for joints adjacent to surfaces receiving water repellent treatment have been installed, 30- day cure time has elapsed, and the surface is dry according to Section 04901.
   1. Water repellent work may precede sealant application only if

sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those used in the work.

E. Test Application: Before performing water-repellent work, including bulk purchase and delivery of products, prepare a small application in an unobtrusive location and in a manner approved by Contractor to demonstrate the final effect (visual, physical, and chemical) of planned application. Proceed with work only after Consultant approves test application or as otherwise directed.
   1. Revisions of planned application, if any, and as requested by Consultant, will be by Change Order if they constitute a departure from requirements of Contract Documents at the time of contracting.

3.2 APPLICATION

A. Mist area with specified product prior to application to ensure that proper adhesion occurs.

B. Apply a heavy-saturation spray coating of water repellent on surfaces indicated for treatment using low-pressure spray equipment. Comply with manufacturer's written instructions application and for using airless spraying procedure, unless otherwise indicated.

C. Apply a second saturation spray coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time, if any, between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

3.3 FIELD QUALITY CONTROL

A. Manufacturer’s Field Service: Provide services of a factory-authorized technical service representative to inspect and approve the substrate before application and to instruct the applicator on the product and application method to be used.

3.4 CLEANING

A. Protective Coverings: Remove protective coverings from adjacent surfaces and other protected areas.

B. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Repair damage caused by water-repellent application. Comply with manufacturers written cleaning instructions.

- - - END - - -

SECTION 07 27 20
FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following: Fluid-Applied Membrane Air Barriers

B. Area of Work:
   1. Duct Shaft above Roof 3A

C. Scope of Work:
   1. Install the fluid applied membrane as designed onto to substrate. Membrane must be installed same day as the preexisting masonry façade is removed and if the substrate behind the brick façade becomes wet at all, even from morning dew, it must be replaced at no added cost to the Owner and any damage on the interior of the building to real or personal property will be the complete a sole liability of the Contractor. The building must remain watertight and secure at all times.
   2. Install new siding per Section 07 41 20 Preformed Manufactured Wall Panels.

1.3 REFERENCES

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only. Editions of applicable publications current on date of issue of bidding documents apply unless otherwise indicated.

1. Air Barrier Association of America (ABAA):Quality Assurance Program
2. American Society of Testing and Materials (ASTM):

C920-10..... Standard Specification for Elastomeric Joint Sealants
C1193-09..... Standard Guide for Use of Joint Sealants
D412-06..... Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
D2369-10..... Standard Test Method for Volatile Content of Coatings
E96/E96M-05.. Standard Test Methods for Water Vapor Transmission of Materials
E162-09..... Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

E783-02..... Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors

E1186-03(2009) Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems

E2178-03..... Standard Test Method for Air Permeance of Building Materials

E2357-05..... Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

3. U.S. Environmental Protection Agency (EPA)

40 CFR 59, Subpart D National Volatile Organic Compound Emission Standards for Consumer and Commercial Products

4. SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD):

1168-89(2003) Adhesive and Sealant Applications

1.4 DESIGN REQUIREMENTS

A. General: Membrane air barrier shall be capable of performing as a continuous vapor- permeable air barrier and as a moisture drainage plane transitioned to adjacent flashings and discharging water to the building exterior. Membrane air barriers shall accommodate substrate movement and seal expansion and control joints, construction material transitions, opening transitions, penetrations, and perimeter conditions without moisture deterioration and air leakage exceeding performance requirements.

B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. per ASTM E 2357.

C. Material Compatibility: Provide membrane air barrier materials that are compatible with one another and with adjacent materials under conditions of service and application required, as demonstrated by membrane air barrier manufacturer based on testing and field experience.

1.5 SUBMITTALS

A. Submit in accordance with Division 1.

B. Product Data: Submit manufacturer's product data sheets on all products to be used for project construction. Submit description for protection, surface preparation, and application.

C. Contractor Qualifications: Submit qualifications of Contractor.

D. Samples for approval as directed by Architect or Owner.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: The Installer must have performed at least 1 projects of similar scope and equal or great dollar value in the past five years. The Installer must also be approved in writing by the Manufacturer for installation of the specified system as part of the submittal process.

B. Project Meeting: Convene a pre-application meeting one week before the start of installation of fluid-applied membrane air barrier. Require attendance of parties directly affecting work of this section, including the Contractor, Architect, and Manufacturer's representative. Review Mock-Up procedures.

C. Field Constructed Mock- Up procedures:
1. Prior to overall installation, apply air and water-resistive barrier system to mock-up wall, verify details for overall installation. Demonstrate tie-ins with adjoining construction and other termination conditions.
2. Construct typical exterior wall panel membrane application, from beam to beam and incorporating 4 panels and a building corner; Illustrating materials interface and seals.
3. Install air and water-resistive barrier mock-ups in field on assemblies constructed of unit concrete, transite and steel. Use the manufacturer's written application instructions.
4. Mock-ups must remain available for inspection, testing, and approval throughout the project.

D. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor's work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in their original sealed containers bearing manufacturer's name and identification of product.

B. Protect coatings (pail products) from freezing temperatures and temperatures in excess of 90 ºF. Store away from direct sunlight.

1.8 PROJECT/SITE CONDITIONS

A. Maintain ambient and surface temperatures above 40 ºF and below 100 ºF during application and drying period, minimum 24 hours after application of air and water-resistive barrier.

B. Provide supplementary heat for installation in temperatures less than 40 ºF or if surface temperature is likely to fall below 40 ºF. (Note: surface temperature is lower than air temperature at night).

C. Exposure limitations: Schedule work to ensure that air and water-resistive barrier system is covered and protected from UV exposure within 180 days of installation. If air and water-resistive barrier membrane

system cannot be covered within 180 days after installation, apply temporary UV protection as recommended by membrane manufacturer.

1.9 COORDINATION/SCHEDULING

A. Coordinate installation all components to provide a continuous air and water resistive barrier.

B. Provide protection of rough openings before installing louvers, doors, and other penetrations through the wall.

C. Provide sill flashing for directing water to the exterior before louvers and doors are installed.

D. Install head flashing immediately after louvers, projections, accessories, and doors are installed.

E. Install diverter flashings wherever water can enter the assembly for directing water to the exterior.

1.10 WARRANTY

A. Manufacturer Labor and Material No-Dollar-Limit Warranty: Manufacturer's standard form in which manufacturer agrees to replace fluid-applied air barrier membrane materials that fail within specified warranty period when installed and used in strict conformance with written manufacturer's instructions.
   1. Failures include, but are not limited to, the following:
      a. Failure to maintain air permeance rating not to exceed .004 cfm/sq. ft when tested per ASTM E2178, within specified warranty period.
      b. Failure to maintain a vapor permeance rating greater than 10 perms when tested in accordance with ATM E96, Method B.
   2. Warranty Period: Five years from date of Substantial Completion.

B. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

C. All warranties and guarantees must be submitted before retainage will be released.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Source Limitations: Obtain primary membrane air barrier materials and accessories from single source from single manufacturer.

B. VOC Content: Maximum 250 g/L per 40 CFR 59, Subpart D (EPA Method 24).

2.2 MEMBRANE AIR BARRIER:

A. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: Synthetic polymer membrane, meeting the following:

1. Air Permeance, ASTM E 2178: 0.004 cfm/sq. ft of surface area at 1.57-lbf/sq. ft. pressure difference.
2. Vapor Permeance, ASTM E 96/E96M: Minimum 10 perms.
3. Elongation, Ultimate, ASTM D 412, Die C: 110 percent, minimum.
4. Combustion Characteristics: Flame spread, not greater than 25; smoke developed, not greater than 150, ASTM E 84.
5. Thickness of Membrane Air Barrier: Not less than 10 wet mils on external gypsum sheathing, applied in single continuous coat.

2.3 ACCESSORY MATERIALS:

A. General: Auxiliary materials recommended by air barrier manufacturer for intended use and compatible with air barrier membrane. Liquid-type auxiliary materials shall comply with VOC Requirements.

B. Primer: Liquid waterborne primer recommended for substrate by membrane air barrier manufacturer for the purpose of consolidating friable edges of cut external gypsum board.

C. Joint Reinforcing: Silyl-Terminated-Poly-Ether (STPE) liquid joint and seam filling material recommended for preparation of joints and seams.

D. Counterflashing: Silyl-Terminated-Poly-Ether (STPE) liquid flashing membrane as recommended to counterflash waterproofing components in new assemblies. E. Rough Opening Treatments: Liquid Silyl-Terminated-Poly-Ether (STPE) as recommended for treatment of rough openings

E. Substrate Patching Material: Silyl-Terminated-Poly-Ether (STPE) liquid patching and filling material as recommended for preparation of cracks and overdriven fasteners, as recommended by air barrier manufacturer.

F. Sprayed Polyurethane Foam Sealant: Foamed-in-place, 1.5- to 2.0-lb/cu. ft density, with flame-spread index of 25 or less per ASTM E 162.

G. Flexible Opening Transition: Cured low-modulus silicone extrusion with reinforcing ribs, sized to fit opening widths, designed for adhesion to or insertion into aluminum framing extrusions, and compatible with air barrier system materials and accessories.

H. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; low modulus, Grade NS, Use NT related to exposure, approved by membrane air barrier manufacturer for adhesion and compatibility with membrane air barrier and accessories.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Surface Condition: Before applying membrane air barrier materials, ensure substrates are fully cured, smooth, clean, dry, and free from high spots, depressions, loose and foreign particles and other deterrents to adhesion.

B. Verify concrete surfaces have cured for time period recommended by membrane air barrier manufacturer, free from release agents, concrete curing agents, and other contaminates.

C. Verify masonry joints are flush and filled with mortar.

3.2 INTERFACES WITH OTHER WORK

A. Commencement of Work: Commence work once membrane air barrier substrates are adequately protected from weather and will remain protected during remainder of construction.

B. Sequencing of Work: Coordinate sequencing of work with work of other sections that form portions of building envelope air barrier to ensure that flashings and transition materials can be properly installed.

C. Subsequent Work: Coordinate work with work of other sections installed subsequent to membrane air barrier to ensure complete inspection of installed membrane air barrier and sealing of membrane air barrier penetrations necessitated by subsequent work.

3.3 AIR BARRIER INSTALLATION

A. General: Prepare substrates and install and apply air barrier components in accordance with air barrier manufacturer's written instructions consistent with manufacturer's qualifying tested assemblies.
   1. Compliance: Prepare substrates and install and apply air barrier components in accordance with requirements of ABAA QAP.

3.4 PREPARATION

A. Prepare and treat substrate in accordance with membrane air barrier manufacturer's written instructions.

B. Mask adjacent finished surfaces.

C. Remove contaminants and film-forming coatings from concrete.

D. Remove projections and excess materials and fill voids with substrate patching material.

E. Prepare and treat joints and cracks in substrate per ASTM C 1193 and membrane air barrier manufacturer's written instructions.

F. Apply primer to substrates, as required.

3.5 APPLICATION OF TRANSITION STRIPS

A. Install transition strips and accessory materials according to membrane air barrier manufacturer's written instructions.

B. Apply membrane air barrier material to adjacent components of building air barrier system, including, but not limited to, roofing system air barrier, exterior glazing and window systems, curtain wall systems, door framing, and other openings.

C. Flexible Opening Transition: Prime perimeter frame surfaces of windows, storefronts, curtain walls, louvers, and doors. Apply flexible opening transition so that a minimum of 4 inches over coverage is achieved over each substrate.
   1. Fill gaps at perimeter of openings with foam sealant.

D. Penetrations: Fill gaps at perimeter of penetrations with foam sealant or closed cell backer rod as recommended by membrane air barrier manufacturer.

E. Flashings: Seal top of through-wall flashings to membrane air barrier with fluid applied counterflashing material as recommended by membrane air barrier manufacturer.

3.6 FLUID AIR-BARRIER MEMBRANE INSTALLATION

A. Apply fluid membrane air barrier material in full contact with substrate to produce a continuous seal with transition strips according to membrane air barrier manufacturers written instructions.
   1. Apply fluid membrane in thickness recommended by manufacturer, but not less than thickness specified in this section.

B. Leave membrane air barrier exposed until tested and inspected by Owner's testing agency and approved by Resident Engineer.

C. Correct deficient applications not passing tests and inspections, make necessary repairs, and retest as required to demonstrate compliance with requirements.

3.7 TESTING:

A. Testing Agency: Contractor shall engage a qualified testing agency to perform tests and inspections, including documenting of membrane air barrier prior to concealment.
   1. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements, including the following:
   2. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
   3. Continuous structural support of air-barrier system has been provided.
   4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
   5. Site conditions for application temperature and dryness of substrates have been maintained.
   6. Maximum exposure time of materials to UV deterioration has not been exceeded.
   7. Surfaces have been primed, if applicable.
   8. Air barrier materials and accessories have complied with minimum requirements.
   11. Compatible materials have been used.
   12. Transitions at changes in direction and structural support at gaps have been provided.

13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
14. All penetrations have been sealed.
15. Inspections and testing shall be carried out at the following rate:
    a. Minimum of 4 manufacturer inspections by the Manufacturer's Representative.
16. Forward written inspection reports to the Resident Engineer within 2 working days of the inspection and test being performed.
17. If the inspections reveal any defects, promptly remove and replace defective work at no additional cost to the Owner.

B. Inspections shall include:
   1. Compatibility of materials within membrane air barrier system and with adjacent materials.
   2. Suitability of substrate and support for membrane air barrier materials.
   3. Suitability of conditions under which membrane air barrier will be applied.
   4. Adequacy of substrate priming, if necessary.
   5. Proper application and joint and seams, flexible opening transitions, and accessory materials.
   6. Continuity and gap-free installation of membrane air barrier, transition strips, and accessory materials.

C. Testing shall include:
   1. Qualitative air-leakage testing per ASTM E 1186.
   2. Quantitative air-leakage testing per ASTM E 783.

D. Audit: Provide installer audit by ABAA. Coordinate scheduling of work and associated audit inspections. Cooperate with ABAA's testing agency. Allow access to work areas and staging. Notify ABAA in writing of schedule for Work of this Section to allow sufficient time for testing and inspection. Do not cover Work of this Section until testing and inspection is accepted. Arrange and pay for site inspections by ABAA to verify conformance with the manufacturer's instructions, the site Quality Assurance Program used by ABAA, and this section of the project specification.

3.8 CLEANING AND PROTECTION

A. Clean spills, stains, and overspray resulting application utilizing cleaning agents recommended by manufacturers of affected construction. Remove masking materials.

B. Protect membrane air barrier from damage from subsequent work. Protect membrane materials from exposure to UV light in excess of that acceptable to membrane air barrier manufacturer; replace overexposed materials and retest.

--- END ---

SECTION 07 41 20
PREFORMED MANUFACTURED WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Formed metal wall panels of type and profile indicated with exposed fasteners.
   2. Furnished and installed metal wall panels and accessories with applicable drawings and this specification. Alternate products to be considered equal must be approved by the Consultant via an addendum 10 days prior to the bid date.

B. Related Sections include the following:
   1. All Divisions.

C. Areas of Work:
   1. Roof 3A

D. Scope of Work:
   1. Install specified fluid-applied membrane air barrier per section 07 27 20.
   2. Install horizontal steel components for new siding façade installation.
   3. Install new specified façade metal panel system, all accessories, and closures where designated on the drawing set and /or as needed to create a weathertight and proper siding facade.
   4. Coordinate installation with roof replacement to ensure that the building remains watertight and secure throughout the project at all times.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide manufactured wall panel assemblies complying with performance requirements indicated and capable of withstanding structural movement, thermally induced movement, and exposure to weather without failure or infiltration of water into the building interior.

B. Air Infiltration: Provide manufactured wall panel assemblies with permanent resistance to air leakage through assembly of not more than 0.09 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a static-air-pressure difference of 4.0 lbf/sq. ft..

C. Water Penetration: Provide manufactured wall panel assemblies with no water penetration as defined in the test method when tested according to ASTM E 331 at a minimum differential pressure of 20 percent of inward acting, wind-load design pressure of not less than 6.24 lb/sq. ft. and not more than 12.0 lb/sq. ft..

D. Structural Performance: Provide manufactured wall panel assemblies

capable of withstanding design wind loads indicated under in-service conditions with deflection no greater than the following, based on testing manufacturer's standard units according to ASTM E 330 by a qualified independent testing and inspecting agency.
1. Maximum Deflection: L/90.

E. Design wind loads shall be as specified below, acting normal to the plane of the wall, or as indicated on the contract drawings.
1. Wind Load: 25 psf

1.4 SUBMITTALS

A. Product Data: Include manufacturer's product specifications, standard details, certified product test results, and general recommendations, as applicable to materials and finishes for each component and for total panel assemblies.

B. Shop Drawings: Show layouts of panels, details of corner conditions, joints, accommodations of thermal movement, all accessories, erection procedures, panel profiles, supports, anchorage's, trim, flashings, closures, joinery, and special details. Distinguish between factory- and field-assembled work. Details shall not be drawn less than one-half (1/2) size.
1. For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by an Ohio licensed and qualified professional engineer responsible for their preparation. The Contractor will pay for the qualified professional engineer within the base scope of work.

C. Samples for Initial Selection: Manufacturer's color charts or chips showing the full range of colors, specified texture, and specified pattern available for wall panels with factory-applied finishes for owner's selection.

D. Samples for Verification: Provide three (3) sample panels 12 inches (300 mm) long by actual panel width, in the profile, style, color, and texture indicated. Include clips, caps, battens, fasteners, closures, and other exposed panel accessories.

E. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

F. A Manufacturer's Certificate of Compliance certifying that the metal panel to be supplied meets or exceeds the requirements contained within this specification.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: The Siding Installer must have been in business as a siding and architectural sheet metal installation for at least the last two-(2) consecutive years and has been solvent for the past two-(2) consecutive years.

B. Panel Supplier shall furnish calculations confirming structural adequacy.

C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated and has been for at least the last five consecutive years.

D. Fire-Test-Response Characteristics: Where fire-resistance-rated wall panel assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Fire-Resistance Ratings: As indicated by design designations in UL's "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.

E. Painted surfaces of metal panels shall meet or exceed specified criteria called out in this specification.

F. Field measurements shall be taken prior to metal panel and flashing fabrication.

E. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver panels and other components so they will not be damaged or deformed. Package panels for protection against damage during transportation or handling.

B. Handling: Exercise care in unloading, storing, and erecting wall panels to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight and ventilated covering. Store panels to ensure dryness. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Protect panel finish per manufacturer’s recommendations.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify location of structural members and openings in substrates by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Established Dimensions: Where field measurements cannot be made without delaying the Work, either establish opening dimensions and proceed with fabricating wall panels without field measurements or allow for trimming panel units. Coordinate wall construction to ensure actual locations of structural members and to ensure opening dimensions correspond to established dimensions.

B. Weather Limitations: Proceed with siding installation only if existing and forecasted weather conditions permit siding to be installed according to manufacturer’s written instructions and if

substrate is completely dry.

1.8 WARRANTY/GUARANTEE

A. General Warranty: Special warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Finish Warranty: Submit a written warranty, signed by manufacturer, covering failure of the factory-applied exterior finish on metal wall panels within the specified warranty period and agreeing to repair finish or replace wall panels that show evidence of finish deterioration. Deterioration of finish includes, but is not limited to, color fade, chalking, cracking, peeling, and loss of film integrity.

C. Finish Warranty Period: 20 years from date of Substantial Completion.

D. The Contractor shall furnish a written five (5) year Guarantee covering labor and materials used in the installation against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the siding contractor and material manufacturer.

1.9 EXTRA MATERIALS

A. Furnish full lengths of matching siding in a quantity equal to 2 percent of amount installed.

PART 2 - PRODUCTS

2.1 EXPOSED WALL PANEL MATERIAL

A. Flush-joint profile with raised flat pan:
   1. Panel Coverage: 12 inches
   2. Panel Depth: 1.50 inches
   3. Material: 20 gage G90 galvanized steel
   4. Texture: Smooth

B. All exterior flashing and trim shall be fabricated in the same material, gage, finish, and color as the exterior profile, unless otherwise noted.

2.2 FINISHES

A. Exterior panel material shall be factory coil coated in one of the manufacturer’s standard finishes and colors. Manufacturer shall provide a minimum of 25 standard colors for selection.
   1. Exposed exterior surface finish shall be DURAGARD PLUS, consisting of 0.8 mil primer with 0.8 mil 70% Kynar 500 or Hylar 5000 color coat and 0.8 mil 70% Kynar 500 or Hylar 5000 clear coat.
      a. Color chosen by Owner
   2. Concealed interior surface finish shall consist of a 0.2 mill primer and 0.3 mil backer coat.

2.3 ACCESSORIES

A. Wall panel system fasteners shall be #14 minimum diameter, self-tapping, with hex head.
   1. Concealed fasteners shall be 300 series stainless steel with 5/8" bonded EPDM and stainless steel washers.
   2. Exposed fasteners shall be 300 series stainless steel with 5/8" bonded EPDM and stainless steel washers coated to match the exterior panel color.

B. Closures shall be metal and foam as required. Foam shall be a pre-cut profile closure of closed cell foam. Metal closures shall be fabricated from the same material, gage, finish, and color as the exterior metal panel.

C. Sealants:
   1. Hidden sealant at all side laps, end laps, and flashing details shall be gun grade non-curing butyl or polymeric non-skinning butyl tape to ensure weather tightness.
   2. Exposed sealant shall be per Section 079200 Joint Sealant.

2.4 PENETRATIONS & TERMINATION SEALANT

A. Liquid Membrane for Details and Terminations: Bituthene Liquid Membrane manufactured by Grace Construction Products; a two-part, elastomeric, trowel grade material designed for use with self-adhered membranes and tapes. 10 g/L max. VOC content.

B. Substrate Patching Membrane: Bituthene Liquid Membrane manufactured by Grace Construction Products; a two- part, elastomeric, trowel grade material designed for use with self-adhered membranes and tapes. 10 g/L max. VOC content.

C. Joint Sealant: Refer to sealant manufacturer’s recommendations.

2.5 FABRICATION

A. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials that are noncompatible or could result in corrosion or deterioration of either materials or finishes.

C. Fabricate panel joints with captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will minimize noise from movements within panel assembly.

2.6 STEEL FRAMING FOR FRAMED ASSEMBLIES

A. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

B. All Hat-Channels shaped be hot dipped galvanized G-90.

C. Minimum Base Metal Thickness: 16 ga

D. Dimensions:
1. Web: 1.5”
2. Leg: ½” with ½” up turn
3. Width: 2”

E. Fasteners: 1/4” diameter stainless steel Hex Head fastener sized to ensure a minimum 1.25” to 1.75” inch embedment. Holes must be predrilled with a 3/16” diameter drill bit. (To be used to connect nailers to concrete deck, coping stones, and vertical masonry wall surfaces)

PART 3 - EXECUTION

3.1 DEMOLITION

A. All existing louvers shall be removed and disposed.

B. The building must remain watertight, airtight, and secure throughout the project.

3.2 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements indicated for conditions affecting performance of metal panel walls.
1. Panel Supports and Anchorage: Examine wall framing to verify that girts, angles, and other secondary structural panel support members and anchorage have been installed to meet requirements of panel manufacturer and are level and plumb.
2. The substructure shall be structurally sound as determined by a Professional Engineer supplied by the Contractor. A letter stating that the substructure is sound must be submitted by the professional engineer.
3. The substructure shall be free of defects detrimental to the metal panel work.
4. Do not proceed with wall panel installation until unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Refer to manufacturer’s literature for requirements for preparation of substrates. Surfaces shall be sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods that are acceptable to manufacturer of the air barrier assembly.

B. Exterior sheathing panels: Ensure that the boards are sufficiently stabilized with corners and edges fastened with appropriate screws in accordance with exterior sheathing manufacturers written instructions.

C. Masonry Substrates: Apply air and vapor barrier over concrete block and brick with smooth trowel-cut mortar joints, struck full and flush. Fill all voids and holes, particularly in the mortar joints, with a lean mortar mix, non-shrinking grout or parge coat.

D. Related Materials: Treat construction joints and install flashing as recommended by manufacturer.

E. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.

F. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

G. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate patching membrane.

H. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

I. At changes in substrate plane, apply sealant or Bituthene Liquid Membrane at sharp corners and edges to form a smooth transition from one plane to another.

J. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.4 HAT CHANNEL INSTALLATION

A. Locate hat channels as follows: One at top and one at bottom of wall and then spaced 5’ o.c. between. Ensure a one inch gap is left between each length of hat channel. All gaps shall line up from top to bottom of each wall.

B. Secure hat channels to existing panels with masonry spaced 16” o.c. top and bottom. Ensure that two fasteners are located at each end of all hat channels.

3.5 PANEL INSTALLATION

A. General: Comply with panel manufacturer's written instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Field cutting panels by torch is not permitted.
   2. Install panels with exposed exterior and interior fasteners, prefinished to match panel finishes.
   3. Locate and space exposed fasteners in true vertical and horizontal alignment. Use proper tools to obtain controlled, uniform compression for positive seal without rupture of neoprene washer.
   4. New steel to be installed, then insulation, followed by exterior panels and closures.

B. Accessories: Install new components required for a complete wall panel assembly including trim, copings, fasciae, mullions, sills, corner units, clips, seam covers, flashings, louvers, sealants, gaskets, fillers, closure strips, and similar items.

C. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not otherwise indicated, types recommended by panel manufacturer.
   1. Install weatherseal to prevent air and moisture penetration. Flash and seal panels at ends and intersections with other materials with rubber, neoprene, or other closures to exclude weather.
   2. Seal panel end laps with a bead of tape or sealant, full width of panel. Seal side joints where recommended by panel manufacturer.
   3. Prepare joints and apply sealants to comply with requirements of Division 7 Section "Joint Sealants."

D. Wall Panels: Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as necessary for waterproofing. Handle and apply sealant and back-up according to sealant manufacturer's written instructions.
   1. Align bottom of wall panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
   2. Install screw fasteners with power tools having controlled torque adjusted to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
   3. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

E. Separate dissimilar metals by painting each metal surface in area of contact with a bituminous coating or by other permanent separation as recommended by manufacturers of dissimilar metals.

F. Coat back side of metal panels with bituminous coating where it will contact wood, ferrous metal, or cementitious construction.

G. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4 inch in 20 feet on level, plumb, and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 ADJUSTING, CLEANING, AND PROTECTING

A. Damaged Units: Replace panels and other components of the Work that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

B. Cleaning: Remove temporary protective coverings and strippable films, if any, as soon as each panel is installed. On completion of panel installation, clean finished surfaces as recommended by panel manufacturer and maintain in a clean condition during construction.

- - - END - - -

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes sheet metal flashing and trim in the following categories:
   1. Roof-drainage systems components.
   2. Exposed trim, coping, gravel stops, and fascia.
   3. Overflow Scupper
   4. Miscellaneous sheet metal flashing

B. Areas of Work:
   1. Roofs 3A and 3B

C. Scope of Work:
   1. Remove all existing sheet metal components and discard unless a component is denoted to remain on the drawing set.
   2. Modify existing components to remain without damaging them. All components to be modified that are damaged will be replaced by the contractor at no cost to the COR.
   3. Install new sheet metal components per the specification and drawing set or as needed to properly terminate the roof system and close all openings in the building's exterior relating to the overall scope of work.
   4. When new sheet metal is installed ensure that if masonry components are present below at least one half brick is covered.
   5. Ensure that when two pieces of metal overlap that the joints do not line up. The joints must be spaced equidistant from each over. In addition, ensure that when two pieces overlap that they are proportionally equal in dimension.

1.03 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

B. Fabricate and install flashing at roof edges to comply with recommendations of FM Loss Prevention Data Sheet 1-49 for the following wind zone:
   1. Wind Zone 2: Wind pressures of 31 to 45 psf.
   2. Contractor is responsible for ensuring that metal installations comply with the Ohio Building Code.

1.04 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details that vary from this specification.

C. Samples of each of the sheet metal components and all necessary accessory items, each in the finish specified. Where finish involves normal color and texture variations, include Sample sets composed of two or more units showing the full range of variations expected.
   1. 8-inch- square Samples of each specified sheet materials to be exposed as finished surfaces.

D. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of recent completed projects including the project names and addresses, names and addresses of the Architects and/or Owners, and any other information as required.

E. Product Data Sheets and Material Safety Data Sheets for all products to be used in sheet metal installation.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: The Installer must have completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance for at least the last ten consecutive years and have been in practice as a roofing contractor for the past ten consecutive years in similar work.

B. Obtain Consultant’s approval of sheet metal details before installation.

C. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.06 PROJECT CONDITIONS

A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure the best weather resistance, durability of Work, and protection of materials and finishes.

1.07 WARRANTY/GUARANTEE

A. The Contractor shall submit a 20-year written Warranty, without monetary limitation, signed by the aluminum manufacturer, guaranteeing the finish will not chalk, change color more than 5 NBS units, crack, check or peel.

B. Wind Rated Manufacturer Warranty: Warranted materials shall be free of defects in material and workmanship for five years after shipment. If, after inspection, the manufacturer agrees that materials are defective, the manufacturer shall, at their option, repair or replace them.
   1. Wind Rated Manufacturer Wind Warranty:
      a. Lifetime, 215 M.P.H. wind warranty

C. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

D. All warranties and guarantees must be submitted and approved by the COR before retainage will be released.

PART 2 - PRODUCTS

2.01 METALS

A. Aluminum: Alloy and temper recommended by the aluminum producer and finisher for type of use and finish indicated and with no less than the strength and durability of alloy and temper designated below:
1. Factory painted aluminum sheet meeting ASTM B 209 and ASTM B 211M, 3003-H14, with a minimum thickness of .040 inch, unless otherwise indicated. All aluminum, except that used for cleats is to be PVDF, color to be selected by the COR.

B. Wind Rated Aluminum: Alloy and temper recommended by the aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:
1. Factory painted aluminum sheet meeting ASTM B 209 and ASTM B 211M, 3003-H14, with a minimum thickness of .040 inch, unless otherwise indicated. All aluminum, except that used for cleats is to be PVDF, color to be selected by the Owner.
2. Manufacturer:
   A. As supplied by the manufacturer of the roof system

C. Stainless-Steel Sheet: ASTM A 167, Type 304 passive, soft annealed, with No. 2D finish, except where harder temper is required for forming or performance; minimum 20 gauge.

D. Coated Galvanized Steel: 24 ga galvanized steel coated with .020” EIP-compatible polymeric coating.
1. Supplied by Membrane Manufacturer
2. Color to be chosen by COR

2.02 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Fasteners: Same metal as sheet metal flashing or other noncorrosive compatible metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

B. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealant as specified in Division 7 Section "Joint Sealants."

C. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

D. Washers: Aluminum capped EPDM washers sized to fit the associated fasteners. Note that neoprene washers are not acceptable.

E. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

2.03 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shops fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication. If Consultant's design exceeds SMACNA, Consultant's design over rides and must be used.

B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Form exposed sheet metal Work that is without oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. If gauge of metal must be increased to accomplish this requirement, the Contractor will do so without added cost to the COR.

D. Expansion Provisions: Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant (concealed within joints).

E. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

F. Separate metal from noncompatible metal or corrosive substrates by covering concealed surfaces at locations of contact with High Temperature Bituthene or other permanent separation as recommended by manufacturer and approved by Consultant, which is compatible with the specified system.

G. Conceal fasteners and expansion provisions must be used where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

H. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" and FMG Loss Prevention Data Sheet 1-49 for application but not less than thickness of metal being secured.

I. Concealed splice plates are to be used for all joints that are not soldered or welded.

J. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

2.04 SHEET METAL FABRICATIONS

A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.

B. Cleat: Fabricate from the following material:
   1. Same material, one gauge heavier than the cover metal.

C. Reglet Counter flashing and other Reglet Materials: Fabricate from the following material:
   1. Stainless Steel: 24 ga.

D. Slip Metal and Surface Mount Counter flashing: Fabricate from the following:
   1. Stainless Steel: 24 ga.

E. Wind Rated Drip Edge: Fabricate from the following:
   1. Cover: Aluminum: .040” minimum gage
   2. Cleat: Continuous Extruded Welded Aluminum (must be extruded aluminum no matter which membrane manufacturer is specified. Galvanized metal will not be acceptable)
   3. Coverage: 5.5”

F. Overflow Scupper: Fabricate with the following material:
   1. Coated Galvanized Steel: 24 ga.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION - GENERAL

A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual”. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement; Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.
   1. Torch cutting of sheet metal flashing and trim is not permitted.

B. Install exposed sheet metal Work that is without oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Provide uniform, neat seams with minimum exposure of solder, welds, and butyl sealant. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as stated below:

1. Separate metal from noncompatible metal or corrosive substrates by covering concealed surfaces, at locations of contact, with High Temperature Bituthene.
2. Bed flanges in thick coat of water block or butyl sealant where required for waterproof performance.

D. Roof-Edge Flashing: Secure metal flashings at roof edges according to FM Loss Prevention Data Sheet 1-49 for specified wind zone.

E. Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

F. Seal joints with sealant specified in Section 07 92 00 as required for watertight construction.
1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 ^{0}F, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 ^{0}F.
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished Work.
1. Do not solder prepainted, metallic-coated steel, and aluminum sheet.
2. Stainless-Steel Soldering: Pretin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
3. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

H. Counter flashings: Coordinate installation of counter flashings with installation of assemblies to be protected by counter flashing. Install counter flashings in reglets or surface mount. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counter flashing joints a minimum of 2 inches and bed with sealant.

I. Roof-Drainage System: Install drainage items fabricated from sheet metal, with straps, adhesives, and anchors recommended by SMACNA's Manual or the item manufacturer, to drain roof in the most efficient manner. Coordinate roof-drain-flashing installation with roof-drainage system installation. Coordinate flashing and sheet metal items for steep-sloped roofs with roofing installation.

J. Equipment Support Flashing: Coordinate equipment support flashing installation with roofing and equipment installation. Weld or seal flashing to equipment support member as shown on the drawing set.

K. Roof Penetration Flashing: Coordinate roof-penetration flashing installation with roofing and installation of items penetrating the roof. Install flashing as follows:
1. Seal and clamp flashing to pipes penetrating roof, other than lead flashing on vent piping.

L. Concrete Splash Pans: Install paver type splash pans where downspouts discharge on the low-sloped roofs, unless otherwise shown.

M. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
1. Use stainless-steel fasteners.

N. Outside corners must be wrapped or bent to form a continuous corner. Inside corners must be cut and lapped to form a continuous corner of the roof surface. No piecing or patching will be allowed.

O. Secure all materials with fasteners spaced 8” on center unless otherwise denoted.

3.03 SURFACE MOUNTED COUNTER FLASHING

A. Surface mounted counter flashing is to be shop-formed from specified metal and shall be made in ten (10) foot sections and overlapped to a minimum of 3 inches. Counter flashing is to be fastened every 8 inches, on-center with appropriate fasteners. Seal the top edge of all flashing with a bead of specified sealant.

3.04 IN-WALL REGLET CUT COUNTER FLASHING

A. Reglet cut counter flashing is to be shop-formed from specified metal and shall be made in ten (10) foot sections and overlapped to a minimum of 3 inches.

B. Top edge of reglet counter flashing shall be set into a fleshly cut reglet in the mortar of the adjoining masonry wall. A V-bent flange shall extend into the joint and be secure with lead wedges spaced 8” o.c.

C. Laps in the counter flashing shall be pop riveted 2” on center and fully soldered. Expansion provisions shall be created every forty feet with a sealant only lap joint.

D. The reglet joint should then be sealed per Section 07 90 00 Joint Sealants which includes primer, backing materials, and sealant.

3.05 SLIP METAL

A. Slip Metal is to be shop-formed from specified metal and shall be made in ten (10) foot sections and overlapped to a minimum of 3 inches. Counter flashing is to be fastened every 8 inches, on-center with appropriate fasteners.

3.06 CONTINUOUS CLEAT

A. The continuous cleat material must be one gage heavier and of the same alloy or compatible metal subject to approval. Color does not have to match.

3.07 WIND RATED DRIP EDGE

A. Set extruded cleat in a bed of sealant over install membrane.

B. Install stainless fasteners through each predrill hole in extruded cleat. Ensure all Manufacturer's instructions and details are met or exceeded.

C. See drawing set for additional information.

D. If additional coverage is required, extender fascia sections are to be installed and proportioned equally with the drip edge. A 100 percent continuous cleat must again be installed and all fasteners concealed. Multiple extenders may be needed. Material and finish must match that of the drip edge.

3.08 OVERFLOW SCUPPER

A. The overflow scupper sleeve is to be formed from specified coated aluminum. An aluminum exterior closure will also be installed over the portion of the sleeve exposed on the exterior of the parapet. This closure will be surface mount secured 8" o. c. Butyl sealant shall be installed to completely separate the two different sheet metal materials.

B. All joints are to be riveted with stainless steel rivets spaced 3 inches on center and then the joints are to be fully covered with welded membrane.

C. The new overflow scupper shall be two courses high by one foot wide and the full width of the masonry wall. A one-inch drip lip shall be created one the exterior.

D. Exterior flanges shall be extended a minimum of one inch on the exterior and four inches on the interior of the masonry components.

E. See drawing set for additional information.

3.09 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

C. All sheet metal components shall be fully protected during the construction process before and after installation. In addition, all sheet metal components installed must be watertight at all times. Any damage to components will be replaced at no cost to the COR. Repairing damaged coatings will not be acceptable.

- - - END - - -

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Roof Curbs and Equipment Supports

B. Area of Work:
   1. Roof 3A and 3B

C. Scope of Work:
   1. Remove and replace all rail supports with new prefabricated equipment supports.
   2. Remove and replace curbs with new insulated curbs as shown on the drawing set.

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

B. Product data for each type of product specified. Submit manufacturer's detailed technical product data, installation instructions, and recommendations, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.

C. Shop drawings showing fabrication and installation of each roof accessory specified including fully dimensioned plans, elevations, sections, details of components, and attachments to other units of Work. Also, show layout, anchorage details, rough-in requirements, and conditions on the roof or for other accessories.

D. Samples for initial selection purposes in the form of manufacturer's color charts showing full range of colors, textures, shapes, and sizes available for each type of roof accessory indicated.

E. Coordination Drawings: Submit coordination drawings for items interfacing with or supporting mechanical or electrical equipment, ductwork, piping, or conduit. Indicate dimensions and locations of items provided under this Section, together with relationships and methods of attachment to adjacent construction and to mechanical or electrical items.

1.4 QUALITY ASSURANCE

A. Standards: Comply with the following:
   1. SMACNA "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap-flashing to coordinate with type of roofing indicated.
   2. NRCA "Roofing and Waterproofing Manual" details for installation of

units.

B The Contractor is fully and solely responsible for the quality of the work performed and in meeting all manufacture and specification requirements and recommendations.

C. Installer Qualifications: The Installer must have completed work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance for at least one year in similar work. In addition, said Installer must be in a solvent financial condition.

D. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.5 WARRANTY/GUARANTEE

A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

B. All warranties and guarantees must be submitted and approved by the COR before retainage will be released.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other non-corrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
1. Where removal of exterior exposed fasteners affords access to building, provide non-removable fastener heads.

B. Gaskets: Manufacturer's standard tubular or fingered design of neoprene or polyvinyl chloride, or block design of sponge neoprene.

C. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, nondrying, non-migrating sealant.

D. Elastomeric Sealant: Generic type recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25, and Uses NT, G, and, A.

2.2 EQUIPMENT SUPPORTS

A. General: Provide equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

B. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 16 gauge thick, hot dipped galvanized steel with welded corner joints.

1. Provide preservative-treated wood nailers at tops of curbs and formed flange at perimeter bottom for mounting to roof.
2. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
3. Fabricate units to ensure that when installed there is a minimum flashing height of 12 inches, unless otherwise indicated, above the finished membrane.
4. Sloping Roofs: Where slope of roof deck is not dead level, fabricate support units with height tapered to match slope to level tops of units.
5. All equipment supports shall be completely insulated with fiberglass insulation.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. General: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, vapor barriers, roof insulation, roofing, and flashing, as required, to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses, as well as inward and outward loading pressures.
1. Except as otherwise indicated, install roof accessory items according to construction details of NRCA "Roofing and Waterproofing Manual”.

B. Isolation: Where metal surfaces of units are to be installed in contact with incompatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation.

C. Flange Seals: All flanges are to be set on the deck and secured with specified roofing screws spaced eight inches on center.

D. Cap Flashing: Where cap flashing is required as component of accessory, install to provide adequate waterproof overlap with roofing or roof flashing (as counter flashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.

E. Operational Units: Test operable units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

F. Contractor is fully and solely responsible to ensure that all units installed are fully functional and meet or exceed performance requirement. Any modifications to existing equipment, wiring, etc. shall be included within the base bid scope of work.

3.2 INSTALLATION

A. General: Install roof accessories according to manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory

installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Install roof accessories to fit substrates and to result in watertight performance.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by permanent separation as recommended by manufacturer.

D. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.

E. Equipment Support Installation:
1. Set equipment support so top surface of equipment support is level.
2. No fasteners shall penetrate the top of the cap of the equipment rail.
3. Secure equipment support with fasteners in each corner and then spaced 12” o.c.

3.3 TOUCH UP.

A. Touch up factory-primed surfaces with compatible primer ready for field painting in accordance with Division 9 Painting Section.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.4 CLEANING AND PROTECTION

A. Clean exposed metal and plastic surfaces according to manufacturer's instructions. Touch up damaged metal coatings.

- - - END - - -

SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes:
   1. Compound/Sealant for sealing metal flashing joints.
   2. Joint filler.
   3. Primer

B. Areas of Work:
   1. Roofs 3A and 3B

C. Scope of Work:
1. Remove all existing sealant materials and backing materials on the following sealant joints:
   a. Masonry to masonry
   b. Metal to metal
   c. Metal to masonry
2. Properly prepare all joints to receive new sealant this includes applying the manufacturer’s standard primer.
3. Install new backer material and sealant to the properly prepared joints. The joints to be sealed are the following.
   a. Masonry to masonry
   b. Metal to metal
   c. Metal to masonry
   Note that the joints above lentils where they adjoin masonry are to be left open to allow for weeping.
   4. Contractor must submit certification from Sealant Manufacturer of date of manufacture. No sealant may be installed that is more than one year old.
   5. Submit adhesion test letter including test procedures and results from the Manufacturer on their letterhead.

1.3 SUBMITTALS

A. General: Submit the following according to Condition of Contract and Division 1 Specification Sections.

B. Product Data and Material Safety sheets for each product to be used during the installation of the specified products. Submit manufacturer’s detailed technical product data, installation instructions, and recommendations, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.

C. Letter of Certification from Sealant Manufacturer of date of manufacture. No sealant may be installed that is more than one year old.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: The Installer must have completed sealant work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance for at least one year.

B. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (4.4 deg C).
3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 WARRANTY/GUARANTEE

A. Submit signed copies of the following warranties against adhesive and cohesive failure of sealant and against infiltration of water and air through sealed joint for period of 3 years from date of completion.
1. Manufacturer's standard warranty covering sealant materials.
2. Manufacturer’s 20-year non-stain warranty.

B. The Contractor shall furnish a written five- (5) year Guaranty covering labor and materials used in the repairs/replacement against leaks and/or faulty workmanship or materials. All costs for any of the above shall be absorbed by the roofing contractor and material manufacturer.

C. Warranties and guarantees must be submitted and approved by COR before retainage will be released.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide the following products:
   1. Exterior Sealant
   2. Primer
      a. Chosen Manufacturer’s Standard Primer
   3. Joint Filler

2.2 EXTERIOR SEALANT

A. Single-Component Silicone Sealant: General-purpose low-modulus, high performance, one-part, neutral-cure, non-staining, low dirt pick-up construction grade silicone sealant.
   1. ASTM C 920, Type S, Grade NS, Class 50

B. Compound must be compatible with all other materials with which it comes in contact.

C. Color shall be per the COR's selection from standard colors. Contractor must get the approved color choice from the COR, prior to installation of sealant.

2.3 PRIMER

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

2.4 JOINT FILLER

A. Seal shall be comprised of water-based, 100% acrylic, impregnated expanding foam sealant with (in sizes where applicable as determined by manufacturer) internal laminations of closed cell (EVA) foam. Alternates containing wax or wax compounds shall not be permitted. Material to be supplied in sticks or rolls, precompressed to less than joint size at mean temperature for ease of installation. Material to be supplied in sticks or rolls, precompressed to less than joint size at mean temperature for ease of installation. Material will contain pressure-sensitive mounting adhesive on one side of the material to aide installation.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime all joint substrates. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Joint Filler to be installed recessed from substrate faces and to receive a field-applied coating of low-modulus liquid sealant not to exceed ¼-inch thick.
1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
4. Splice sections together by cutting ends at 45 degrees perpendicular to the joint.
5. Cover all backing material with sealant installation complete, making the joint completely weathertight and the top and sides, the same day. If any backer material gets wet, it is to be fully removed and reinstalled, even if sealant was installed over the backer material, with no added cost to the Owner.

D. Install bond-breaker tape where joint filler are not used between sealants and back of joints.

E. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealants from surfaces adjacent to joint.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint configuration.

3.3 SILICONE SEALANT INSTALLATION

A. Preparation
   1. Clean all concrete and stone joints of all contaminants and impurities.
   2. Porous substrates should be cleaned where necessary by grinding, saw cutting, blast cleaning (sand or water), mechanical abrading or a combination of these methods as required to provide a sound, clean, dry surface for sealant application.
   3. Dust, loose particles, etc., should be blown out of joints with dry, oil-free compressed air or be vacuum cleaned.
   4. Metal and glass surfaces adjacent to masonry should be cleaned by wiping with an oil-free absorbent cloth saturated with solvent such as xylene or toluene. Do not use alcohols as they inhibit the cure.

B. Priming
   1. Primer should be applied before installing the backer rod.
   2. Follow the Manufacturer’s recommendations for removal of existing sealants, substrate cleaning, joint preparation and installation of silicone building sealants are not intended and may not be appropriate for remedial work involving existing sealants and/or joints containing PCBs or other potentially hazardous substances. If you know or suspect that the existing sealants and/or joints contain PCBs or other hazardous substances, contact a knowledgeable authority on appropriate removal, handling, and disposal procedures.
   3. Follow the solvent manufacturer’s safe handling recommendations and local, state, and federal regulations regarding solvent usage.
   4. In all cases, a sample should be tested and/or test joints should be installed on the project.

C. Masking
   1. Areas adjacent to joints may be masked to ensure neat sealant lines.
   2. Do not allow masking tape to touch clean surfaces to which the silicone sealant is to adhere.
   3. Tooling should be completed in one continuous stroke immediately after sealant application and before a skin forms.
   4. Masking should be removed immediately after tooling.

D. Application
   1. Allow all solvents and primers to completely evaporate and/or react (15-60 minutes, depending on conditions and substrates) prior to sealant installation.
   2. The use of alcohols (IPA, denatured, etc.) for cleaning purposes is not recommended due to the potential for cure inhibition.
   3. Sealant should be applied in a continuous operation.
   4. A positive pressure adequate to properly fill and seal the joint width should be employed.
   5. Tool or strike sealant with light pressure to spread the material against the backup material and the joint surfaces.
   6. *Do not use soaps, oil, or alcohols as tooling aids as they may inhibit the cure and potentially interfere with sealant adhesion.*

7. Use a tool with a concave profile to keep sealant within the joint.
8. The sealant can be applied at outdoor temperatures as low as -29°C (-20°F), provided that surfaces are clean, dry and frost-free. As a general rule, condensation or frost should not be a problem above 4.4°C (40°F).
9. Do not allow uncured silicone sealants to contact nonabradable surfaces such as polished granites, metal, or glass.
10. Uncured sealant will leave a film that may change the aesthetic surface characteristics of these substrates. Inadvertently applied sealant should be cleaned from nonporous surfaces before curing using solvent.

3.4 CLEANING

A. After installation, clean all adjacent surfaces of excess compound to the COR's satisfaction.

- - - END - - -

SECTION 08 43 00
ALUMINUM STOREFRONT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Framing
   2. Insulated Blanks
   3. Interior Trim

B. Area of Work:
   1. Roof 3A and 3B

C. Scope of Work:
   1. Remove of all existing framing, glass, panels, accessories, etc.
   2. Install all new framing, glass, panels, and associated components per specification and manufacturer’s requirements.
   3. Install extruded two piece interior trim to match existing removed.
   4. Clean all new windows components, including glass, and surrounding building components, such as lintels where they exist.
   5. Note that the building must be watertight and secure at all times.
   6. See drawing set for more requirements.

1.3 SYSTEM DESCRIPTION

A. The windows shall be Architectural Aluminum Project-Out Windows in accordance with ANSI/AAMA 101 Voluntary Specifications for Aluminum and Poly Prime Windows and Glass Doors and AAMA 910, Voluntary “Life Cycle” Specifications and Test Methods for Architectural Grade Windows, Sliding Glass Doors for a Class and Grade of P-AW70.

B. Test Units.
   1. All test unit sizes and configurations shall conform to the minimum size in accordance with ANSI/AAMA 101 and AAMA 910.
   2. Units submitted for laboratory testing shall be units of the manufacturer’s standard construction, glazed and assembled in accordance with the manufacturer’s specifications and ANSI/AAMA 101.

C. Performance Requirements
   1. Air Infiltration: When closed and locked, test specimen shall be tested in accordance with ASTM E283 at a minimum vent size of 5' x 3'. The air infiltration rate shall not exceed 0.10 cfm/ft of vent perimeter at a static air pressure differential of 6.24 psf.
   2. Water Resistance: When closed and locked, the test specimen shall be tested in accordance with ASTM E547 and ASTM E331 at a minimum vent size of 5' x 3'. There shall be no leakage as defined in the test method at a static air pressure differential of 12 psf.
   3. Uniform Load Deflection: A minimum static air pressure difference of 70 psf shall be applied in the positive and negative direction in accordance with ASTM E330. There shall be no deflection in excess of L/175 of the span of any framing member.
   4. Uniform Load Structural Test: A minimum static air pressure difference of 105 psf shall be applied in the positive and negative direction in accordance with ASTM E330. The unit shall be evaluated after each load.
   5. Component Testing: Window components shall be tested in accordance with procedures described in ANSI/AAMA 101.
   6. Condensation Resistance Test: (CRF) when tested in accordance with AAMA 1503.1, the condensation resistance factor shall not be less than 53.
   7. Thermal Transmittance Test: (U-Value): When tested in accordance with AAMA 1503.1, the thermal transmittance (U-Value) shall not be more than .59 BTU/hr/sf/°F.
   8. Life cycle testing for architectural grade windows when tested in accordance with AAMA 910, there shall be no damage to fasteners, hardware parts, support arms, actuating mechanisms or any other damage which would cause the window to be inoperable, and air infiltration and water resistance tests shall not exceed the primary performance specified herein.
   9. Forced Entry Resistance: All windows shall conform to AAMA 1302.5.
   10. Sound Performance: When tested in accordance with ASTM E90 and E413, the sound transmission loss (STL) shall not be less than 37.
   11. Thermal Barrier Tests.
      a. Testing shall be in general accordance with AAMA TIR-A8, Structural Performance Poured and Debridged Framing System.

D. Storefront System Performance Requirements:
   1. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft 2 at a static air pressure differential of 6.24 psf.
   2. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 8 psf as defined in AAMA 501.

3. Uniform Load: A static air design load of 20 psf shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
4. Thermal Transmittance (U-value): When tested to AAMA Specification 1503, the thermal transmittance (U-value) shall not be more than:
   a. Glass to Exterior – 0.47 (low-e) or 0.61 (clear)
   b. Glass to Center – 0.44 (low-e) or 0.61 (clear)
   c. Glass to Interior – 0.41 (low-e) or 0.56 (clear)
5. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
   a. Glass to Exterior – 70 frame and 69 glass (low-e) or 69 frame and 58 glass (clear).
   b. Glass to Center – 62 frame and 68 glass (low-e) or 60 frame and 58 glass (clear).
   c. Glass to Interior – 56 frame and 67 glass (low-e) or 54 frame and 58 glass (clear).
6. Sound Transmission Class (STC): When tested to AAMA Specification 1801 and in accordance with ASTM E 1425, the STC Rating shall not be less than:
   a. Glass to Exterior – 38
   b. Glass to Center – 37

c. Glass to Interior – 38

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data: manufacturer's specifications and test reports from an AAMA-accredited laboratory.

C. Shop drawings: window location chart; typical window elevations; details of assemblies, hardware, and glazing details for factory-glazed units.

D. Samples for initial color selection on 12-inch- (300-mm-) long sections of window members. Where finishes involve normal color variations, include Sample sets showing the full range of variations expected.

E. Samples for Verification: The Consultant reserves the right to require additional samples that show fabrication techniques, workmanship, and design of hardware and accessories.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed installation of aluminum windows similar in material, design, and extent to those required for this Project and with a record of successful in-service performance for at least the last year.

B. Single-Source Responsibility: Obtain aluminum windows from one source and by a single manufacturer.

C. Submit for prebid approval ten days before bid opening a sample window representing the bid window except for color and valid test reports from an AAMA-accredited laboratory conforming to test results.

D. Bidder must identify manufacturer and model of product on which the bid is based.

E. Furnish a valid AAMA “Notice of Product Certification” indicating that the windows for the project conform to AAMA/NWWDA 101/I.S.2-97.

F. Furnish visible, permanent IGCC certification labels for the CBA rating level on dual-seal double insulating glass units.

G. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.6 PROJECT CONDITIONS

A. Field Measurements: Check window openings by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Windows must be manufactured to ensure that each window has a maximum ¼ inch clearance around entire perimeter of the window.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Handle and protect windows and accessories in accordance with AAMA CW-10-97 until project completion.

B. All materials must be protected from the weather and secured by the contractor.

1.8 WARRANTY

A. Storefront: Ten (10) years from Date of Substantial Completion.

B. Dual-seal insulating glass units: warrant seal for ten years against visual obstruction from film formation or moisture collection between internal glass surfaces, excluding that caused by glass breakage or abuse.

C. The Contractor shall furnish a written five- (5) year Guaranty covering labor and materials used in the repairs/replacement against leaks and/or faulty workmanship or materials. All costs for any of the above shall be absorbed by the roofing contractor and material manufacturer.

D. The Contractor shall submit a 10-year written Warranty, without monetary limitation, signed by the aluminum manufacturer, guaranteeing the finish. This warranty shall include the finish on the insulated blank panels.

E. All warranties and guarantees must be submitted and approved by the owner before retainage will be released.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum (Storefront and Components):
   1. Material Standard: Extruded Aluminum, ASTM B 221; 6063-T5 alloy and temper.
   2. Member Wall Thickness: Each framing member shall provide structural strength to meet specified performance requirements.
   3. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.
   4. Depth of Framing: 4.5″
   5. Width of Framing: 2″

C. Mullions and Cover Plates: Shall be extruded aluminum of 6063-T5 alloy and temper of profile and dimensions indicated on drawings. Mullions shall provide structural properties to resist wind pressure required by performance criteria and standards.

D. Thermal Barrier.
   1. The thermal barrier shall have a minimum 3/8" separation consisting of a two-part, chemically curing high-density polyurethane which is mechanically and adhesively bonded to the aluminum.

E. Fasteners: Where exposed, shall be Stainless Steel.

F. Gaskets: Glazing gaskets shall be extruded EPDM rubber.

G. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

H. Interior trim: PVDF finished two piece rectangular trim. Sizes vary to match existing. See drawings.

2.3 FABRICATION

A. General:
1. Fabricate components per manufacturer’s installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
2. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.
3. Prepare components to receive anchor devices. Fabricate anchors.
4. Arrange fasteners and attachments to conceal from view.

B. Frame: .125” Nominal wall thickness; screw-spline frame joinery.

C. Water control: fully weeped with matching weep covers.

2.4 INSULATED PANEL

A. Product: Water Resistant Opaque Glazing Panels
1. Panel Composition:
a. Face Skin: .024" (minimum) Premium PVDF prefinished smooth aluminum, to match window frames.
b. Face Stabilizer: 4mm high density polypropylene
c. Core: 5/8" polyisocyanurate (ISO) foam
d. Back Stabilizer: 4mm high density polypropylene
e. Back Skin: .024" (minimum) Premium PVDF prefinished smooth aluminum, to match window frames.
2. Panel Tolerances:
a. Thickness: ±1/32"
b. Length and Width: +0, -1/8"
c. Squareness: 1/64" per lineal foot
3. Attachment System:
a. To be used as glazing infill or inserted into encapsulating watertight channel.

B. Coating: FLUROPON® - 70% PVDF 500 – AAMA 2605 Fluropolymer Coating.
1. Color as chosen by COR

2.5 FINISH ON ALUMINUM EXTRUSIONS

A. Application: on clean extrusions free from serious surface blemishes; on exposed surfaces visible when installed product's operating sash is closed.

B. Coating: Coating: FLUROPON® - 70% PVDF 500 – AAMA 2605 Fluropolymer Coating.
1. Color as chosen by COR

2.6 INSTALLATION ACCESSORIES

A. Fasteners: All shall be 300 Series, Stainless Steel.

B. Fasteners:
   1. Self-Tapping Steel Fasteners:
      a. Description: Stainless steel self drilling fastener.
   2. Concrete/Masonry Anchors:
      a. Description: 1/4″ diameter stainless steel fastener sized to ensure a minimum 1.25″ to 1.75″ inch embedment. Holes must be predrilled with a 3/16″ diameter drill bit.

C. Spacers and Bases: EPDM sized to ensure proper installation.

PART 3 - EXECUTION

3.0 REMOVAL AND INSPECTION

A. Remove existing window, sealant, and all accessories from the openings scheduled for replacement. Properly dispose of materials that are removed.

B. No more windows can be removed each day than that new windows can be installed.

C. Ensure that all masonry restoration work has been completed prior to the installation of the windows.

D. Inspect openings before installation. Verify that rough or masonry opening is correct and sill plate is level.
   1. Masonry surfaces shall be visibly dry and free of excess mortar, sand, and other construction debris.

3.1 PREPARATION

A. Prepare openings to be in tolerance, plumb, level, provide for secure anchoring, and in accordance with approved shop drawings.

3.2 INSTALLATION

A. General: Install store front and window units plumb, level, and true to line, without warp or rack of frames or sash with manufacturer’s prescribed tolerances. Provide support and anchor in place.
   1. Dissimilar Materials: Provide separation of aluminum materials and other corrodible surfaces from sources of corrosion or electrolytic action contact points by complying with AAMA 101, Appendix, titled “Dissimilar Materials”.

2. Weathertight Construction: Install sill members and other members in a bed of sealant or with joint filler or gaskets, to provide weathertight construction. Coordinate installation with wall flashings and other components of construction.
   a. Refer to Division 7 Joint Sealants for installation requirements.

C. Assembly as many components off site as practical. Ensure that all components are connected in a true and plumb manner and that all joints are hairline tight. Secure frame to opening with fasteners spaced six inches from each corner and 16 inches on center. See drawing set for more information.
   1. At sill receptor fasteners securing frame shall not penetrate the horizontal portion of the receptor; they shall be installed through predrilled and countersunk holes in the vertical leg. All heads of the fasteners must be painted to match finish of the framing.

C. Install windows in accordance with manufacturer's recommendations and approved shop drawings with skilled craftspeople that have demonstrated a successful history of installing windows for ten years.

D. Provide required support, securely fasten, and set windows plumb, square, and level without twist or bow.

E. Apply specified sealant per sealant manufacturer's recommendations at joints, wipe off excess, and leave exposed sealant surfaces clean and smooth. Note that proper backing material and primer must be used at all locations.

F. Ensure that the heads of all fasteners are painted to match frames.

3.3 ADJUSTING

A. Adjusting: Adjust operating window components to provide a tight fit at contact points and at weather stripping for smooth operation and a weathertight closure.

B. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer’s instructions before owner’s acceptance. This includes cleaning all glass and frame components. Remove construction debris from project site and legally dispose of debris.

C. Protection: Protect installed product’s finish surfaces from damage during construction. Protect aluminum windows from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants. Remove and replace damaged aluminum windows at no extra cost.

3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to aluminum window manufacturer, that ensure window units are without damage or deterioration at the time of Substantial Completion.

--- END ---

SECTION 08 80 00
GLAZING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies glass, related glazing materials and accessories. Glazing products specified apply to factory or field glazed items.

1.2 RELATED WORK

A. Section 08 43 00, Aluminum Storefront.

1.3 LABELS

A. Temporary labels:
   1. Provide temporary label on each light of glass identifying manufacturer or brand and glass type, quality and nominal thickness.
   2. Label in accordance with NFRC (National Fenestration Rating Council) label requirements.
   3. Temporary labels shall remain intact until glass is approved by COR.

1.4 PERFORMANCE REQUIREMENTS

A. Building Enclosure Vapor Retarder and Air Barrier:
   1. Utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
   2. Maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

B. Glass Thickness:
   1. Select thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with ASCE 7 code.
   2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
   3. Test in accordance with ASTM E 330.
   4. Thicknesses listed are minimum. Coordinate thicknesses with framing system manufacturers.

1.5 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Certificates:
   1. Certificates stating that wire glass, meets requirements for safety glazing material as specified in ANSI Z97.1.
   2. Certificate on shading coefficient.

3. Certificate on "R" value when value is specified.
4. Certificate test reports confirming compliance’s with specified bullet resistive rating.
5. Certificate that blast resistant glass meets the requirements of UFC4-010-01.

C. Warranty: Submit written guaranty, conforming to General Condition requirements, and to “Warranty of Construction” Article in this Section.

D. Manufacturer's Literature and Data:
1. Glass, each kind required.
2. Insulating glass units.
3. Glazing cushion.
4. Sealing compound.

E. Samples:
1. Size: 150 mm by 150 mm (6 inches by 6 inches).
2. Tinted glass.

F. Preconstruction Adhesion and Compatibility Test Report: Submit glazing sealant manufacturer’s test report indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery: Schedule delivery to coincide with glazing schedules so minimum handling of crates is required. Do not open crates except as required for inspection for shipping damage.

B. Storage: Store cases according to printed instructions on case, in areas least subject to traffic or falling objects. Keep storage area clean and dry.

C. Handling: Unpack cases following printed instructions on case. Stack individual windows on edge leaned slightly against upright supports with separators between each.

1.7 PROJECT CONDITIONS

A. Field Measurements: Field measure openings before ordering tempered glass products. Be responsible for proper fit of field measured products.

1.8 WARRANTY

A. Warranty: Conform to terms of "Warranty of Construction", FAR clause 52.246-21, except extend warranty period for the following:
1. Bullet resistive plastic material to remain visibly clear without discoloration for 10 years.
2. Insulating glass units to remain sealed for 10 years.

1.9 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American National Standards Institute (ANSI):

Z97.1-04.....Safety Glazing Material Used in Building - Safety Performance Specifications and Methods of Test.

C. American Society for Testing and Materials (ASTM):

C1363-05.....Thermal Performance of Building Assemblies, by Means of A Hot Box Apparatus

C542-05.....Lock-Strip Gaskets.

C716-06.....Installing Lock-Strip Gaskets and Infill Glazing Materials.

C794-06.....Adhesion-in-Peel of Elastomeric Joint Sealants.

C864-05.....Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.

C920-08.....Elastomeric Joint Sealants.

C964-07.....Standard Guide for Lock-Strip Gasket Glazing.

C1036-06.....Flat Glass.

C1048-04.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.

C1376-10.....Pyrolytic and Vacuum Deposition Coatings on Flat Glass.

E84-09.....Surface Burning Characteristics of Building Materials.

E330-02.....Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

E2190-08.....Insulating Glass Unit

D. Code of Federal Regulations (CFR):

16 CFR 1201 - Safety Standard for Architectural Glazing Materials; 1977, with 1984 Revision.

E. National Fenestration Rating Council (NFRC)

F. Safety Glazing Certification Council (SGCC)2009:

Certified Products Directory (Issued Semi-Annually).

G. Glass Association of North America (GANA):

Glazing Manual (Latest Edition)

Sealant Manual (2008)

H. American Society of Civil Engineers (ASCE):

ASCE 7-10.....Wind Load Provisions

PART 2 - PRODUCT

2.2 TEMPERED GLASS

A. Clear Tempered Glass:
   1. ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3.
   2. Thickness, 6 mm (1/4 inch).

B. Tinted Tempered Glass.
   1. ASTM C1048, Kind FT, Condition A, Type I, Class 2, Quality q3.
   2. Color: Gray tint as selected by COR.
   3. Thickness, 6 mm (1/4 inch).

2.3 INSULATING GLASS UNITS

A. Provide factory fabricated, hermetically sealed glass unit consisting of two panes of glass separated by a dehydrated air space and comply with ASTM E2190.

B. Sealed Edge Units (SEU):
   1. Insulating Glass Unit Makeup
      a. Outboard Lite
         1. Glass type: Tinted Tempered Glass.
         2. Glass Tint: Gray tint as selected by COR.
         3. Nominal Thickness: 6 mm (1/4 inch).
         4. Glass Strength: Tempered.
         5. Coating Orientation: Surface #2.
      b. Spacer
         1. Nominal Thickness: ½ inch.
         2. Gas Fill: Air.
      c. Inboard Lite
         1. Glass Type: Clear Tempered.
         2. Low-E Coating: Sungate 500 (3) Clear.
         3. Nominal Thickness: 6 mm (1/4 inch).
         4. Glass Strength: Tempered.
         5. Coating Orientation: Surface #3.
   2. Performance Characteristics (Center of Glass)
      a. Visible Transmittance: 3%
      b. Visible Reflectance: 5%
      c. Winter U-factor (U-value): 0.48
      d. Shading Coefficient (SC): 0.19
      e. Solar heat Gain Coefficient (SHGC): 0.14

3. Glass shall be annealed, heat strengthened or tempered as required by codes, or as required to meet thermal stress and wind loads.
4. Glass heat-treated by horizontal (roller hearth) process with inherent roller wave distortion parallel to the bottom edge of the glass as installed when specified.

2.4 GLAZING ACCESSORIES

A. As required to supplement the accessories provided with the items to be glazed and to provide a complete installation. Ferrous metal accessories exposed in the finished work shall have a finish that will not corrode or stain while in service.

B. Setting Blocks: ASTM C864:
1. Channel shape; having 6 mm (1/4 inch) internal depth.
2. Shore a hardness of 80 to 90 Durometer.
3. Block lengths: 50 mm (two inches) except 100 to 150 mm (four to six inches) for insulating glass.
4. Block width: Approximately 1.6 mm (1/16 inch) less than the full width of the rabbet.
5. Block thickness: Minimum 4.8 mm (3/16 inch). Thickness sized for rabbet depth as required.

C. Spacers: ASTM C864:
1. Channel shape having a 6 mm (1/4 inch) internal depth.
2. Flanges not less 2.4 mm (3/32 inch) thick and web 3 mm (1/8 inch) thick.
3. Lengths: One to 25 to 76 mm (one to three inches).
4. Shore a hardness of 40 to 50 Durometer.

D. Sealing Tapes:
1. Semi-solid polymeric based material exhibiting pressure-sensitive adhesion and withstanding exposure to sunlight, moisture, heat, cold, and aging.
2. Shape, size and degree of softness and strength suitable for use in glazing application to prevent water infiltration.

E. Glazing Gaskets: ASTM C864:
1. Firm dense wedge shape for locking in sash.
2. Soft, closed cell with locking key for sash key.
3. Flanges may terminate above the glazing-beads or terminate flush with top of beads.

F. Neoprene: ASTM C864.
1. Channel shape; flanges may terminate above the glazing channel or flush with the top of the channel.

2. Designed for dry glazing.

G. Color:

1. Color of glazing compounds, gaskets, and sealants used for aluminum color frames shall match color of the finished aluminum and be nonstaining.
2. Color of other glazing compounds, gaskets, and sealants which will be exposed in the finished work and unpainted shall be black, gray, or neutral color.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Examine openings for glass and glazing units; determine they are proper size; plumb; square; and level before installation is started.
2. Verify that glazing openings conform with details, dimensions and tolerances indicated on manufacturer’s approved shop drawings.

B. Advise Contractor of conditions which may adversely affect glass and glazing unit installation, prior to commencement of installation: Do not proceed with installation until unsatisfactory conditions have been corrected.

C. Verify that wash down of adjacent masonry is completed prior to erection of glass and glazing units to prevent damage to glass and glazing units by cleaning materials.

3.2 PREPARATION

A. For sealant glazing, prepare glazing surfaces in accordance with GANA-02 Sealant Manual.

B. Determine glazing unit size and edge clearances by measuring the actual unit to receive the glazing.

C. Shop fabricate and cut glass with smooth, straight edges of full size required by openings to provide GANA recommended edge clearances.

D. Verify that components used are compatible.

E. Clean and dry glazing surfaces.

F. Prime surfaces scheduled to receive sealants, as determined by preconstruction sealant-substrate testing.

3.3 INSTALLATION - GENERAL

A. Install in accordance with GANA-01 Glazing Manual and GANA-02 Sealant Manual unless specified otherwise.

B. Glaze in accordance with recommendations of glazing and framing manufacturers, and as required to meet the Performance Test Requirements specified in other applicable sections of specifications.
C. Set glazing without bending, twisting, or forcing of units.
D. Do not allow glass to rest on or contact any framing member.
E. Glaze doors in a securely fixed or closed and locked position, until sealant, or glazing compound.
F. Tempered Glass: Install with roller distortions in horizontal position unless otherwise directed.
G. Insulating Glass Units:
   1. Glaze in compliance with glass manufacturer's written instructions.
   2. When glazing gaskets are used, they shall be of sufficient size and depth to cover glass seal or metal channel frame completely.
   3. Do not use putty or glazing compounds.
   4. Do not grind, nip, cut, or otherwise alter edges and corners of fused glass units after shipping from factory.

3.4 INSTALLATION - DRY METHOD (TAPE AND GASKET SPLINE GLAZING)

A. Cut glazing tape or spline to length; install on glazing pane. Seal corners by butting and sealing junctions with butyl sealant.
B. Place setting blocks at 1/3 points with edge block no more than 150 mm (6 inches) from corners.
C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
D. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
F. Trim protruding tape edge.

3.5 REPLACEMENT AND CLEANING

A. Clean new glass surfaces removing temporary labels, paint spots, and defacement after approval by Resident Engineer.
B. Replace cracked, broken, and imperfect glass, or glass which has been installed improperly.
C. Leave glass, putty, and other setting material in clean, whole, and acceptable condition.

3.6 PROTECTION

A. Protect finished surfaces from damage during erection, and after completion of work. Strippable plastic coatings on colored anodized finish are not acceptable.

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SECTION 09 90 00
EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
   1. Surface preparation, priming, and application of two finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.

B. Areas of Work:
   1. Roof 3A and 3B

C. Scope of Work:
   1. Painting includes preparing and field-painting the following components:
      a. The portions of steel exposed above roofline and those exposed during masonry restoration.
      b. The paint system includes preparing, one primer coat, and two finish coats.

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each paint system specified, including block fillers and primers.
   1. Provide the manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use.
   2. List each material and cross-reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.
   3. Certifications by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOC’s).

C. Samples for initial color selection in the form of manufacturer's color charts.
   1. After color selection, the Contractor will furnish color chips for surfaces to be coated.

D. Samples for Verification Purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.

1. Provide stepped samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture is achieved.
2. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
3. Submit samples on the following substrates for the Consultant's review of color and texture only:
   a. Ferrous Metal: Provide two 4-inch square samples of flat metal and two 8-inch long samples of solid metal for each color and finish.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: The experienced applicator must have completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance for at least the last five consecutive years.

B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

C. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.
   1. Final acceptance of colors will be from job-applied samples.
   2. The Consultant will select one surface to represent surfaces and conditions for each type of coating and substrate to be painted. Apply coatings surface according to the schedule or as specified.
      a. After finishes are accepted, this room or surface will be used to evaluate coating systems of a similar nature.

D. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor's work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
   1. Product name or title of material.
   2. Product description (generic classification or binder type).
   3. Manufacturer's stock number and date of manufacture.
   4. Contents by volume, for pigment and vehicle constituents.
   5. Thinning instructions.
   6. Application instructions.
   7. Color name and number.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 ºF. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
   1. Protect from freezing. Keep storage area neat and orderly. Remove

oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 ºF and 90 ºF.

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 ºF and 95 ºF.

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 ºF above the dew point; or to damp or wet surfaces.
   1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

1.7 WARRANTY/GUARANTEE

A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

B. All warranties and guarantees must be submitted before retainage will be released.

PART 2 - PRODUCTS

2.1 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.

B. Material Quality: Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.

C. Colors: Provide color selections made by the COR from the manufacturer's full range of standard colors.

2.2 PRIMERS

A. Primers: Modified Aromatic Polyurethane Primer - A single component, moisture-cured resin, containing a blend of micaceous iron oxide and zinc.

2.3 EXTERIOR FINISH PAINT MATERIAL

A. Finish Paint: Waterborne Acrylic Epoxy - High performance semi-gloss coating suitable for concrete and steel that has high-build, low odor,

non-yellowing white and fade resistant colors; easy cleanup and stain-, abrasion-, chemical and moisture-resistance.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.
   1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
   2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
   1. Notify the Consultant about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.
   1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
   2. Ferrous Metals: Clean ungalvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).
      a. Power Brush clean as recommended by the paint system manufacturer and according to requirements of SSPC specification SSPC-SP 3.
      b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
      c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.

3. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
3. Use only thinners approved by the paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
1. Paint colors, surface treatments, and finishes are indicated in the schedules.
2. Provide finish coats that are compatible with primers used.
3. The number of finish coats, two, and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
5. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
6. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
7. Omit primer on metal surfaces that have been shop-primed and touch-up painted.

C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and

where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

D. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.
   1. Brushes: Use brushes best suited for the material applied.
   2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.

E. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

F. Prime Coats: Before applying finish coats, apply a primer coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

G. Pigmented (Opaque) Finishes: Completely cover with two coats of paint to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

H. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.

3.4 FIELD QUALITY CONTROL

A. The COR reserves the right to invoke the following test procedure at any time and as often as the COR deems necessary during the period when paint is being applied:
   1. The COR may engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
   2. The testing agency may perform appropriate tests for the following characteristics as required by the COR:
      a. Quantitative materials analysis.
      b. Abrasion resistance.
      c. Apparent reflectivity.
      d. Flexibility.
      e. Washability.
      f. Absorption.
      g. Accelerated weathering.
      h. Dry opacity.
      i. Accelerated yellowness.
      j. Recoating.
      k. Skinning.
      l. Color retention.
      m. Alkali and mildew resistance.
   3. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
   1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
   1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

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SECTION 09 91 00
INTERIOR PAINTING

PART 1-GENERAL

1.1 DESCRIPTION

A. Section specifies interior field painting.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:
Before work is started, or sample panels are prepared, submit manufacturer's literature, the current Master Painters Institute (MPI) "Approved Product List" indicating brand label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use subsequent MPI "Approved Product List", however, only one list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI "Approved Product List" where applicable is acceptable.

C. Sample Panels:
1. After painters' materials have been approved and before work is started submit sample panels showing each type of finish and color specified.
2. Panels to show color: Composition board, 100 by 250 by 3 mm (4 inch by 10 inch by 1/8 inch).
3. Attach labels to panel stating the following:
   a. Federal Specification Number or manufacturers name and product number of paints used.
   b. Product type and color.
   c. Name of project.
4. Strips showing not less than 50 mm (2 inch) wide strips of undercoats and 100 mm (4 inch) wide strip of finish coat.

D. Manufacturers' Certificates indicating compliance with specified requirements:
1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.

1.3 DELIVERY AND STORAGE

A. Deliver materials to site in manufacturer's sealed container marked to show following:
1. Name of manufacturer.
2. Product type.

3. Batch number.
4. Instructions for use.
5. Safety precautions.

B. In addition to manufacturer's label, provide a label legibly printed as following:
1. Federal Specification Number, where applicable, and name of material.
2. Surface upon which material is to be applied.
3. If paint or other coating, state coat types; prime, body or finish.

C. Maintain space for storage, and handling of painting materials and equipment in a neat and orderly condition to prevent spontaneous combustion from occurring or igniting adjacent items.

D. Store materials at site at least 24 hours before using, at a temperature between 18 and 30 degrees C (65 and 85 degrees F).

1.4 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by basic designation only.

B. American Conference of Governmental Industrial Hygienists (ACGIH):

ACGIH TLV-BKLT-2012.....Threshold Limit Values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs)

ACGIH TLV-DOC-2012......Documentation of Threshold Limit Values and Biological Exposure Indices, (Seventh Edition)

C. Master Painters Institute (MPI):

No. 45-12..............Interior Primer Sealer

No. 50-12..............Interior Latex Primer Sealer

No. 52-12..............Interior Latex, MPI Gloss Level 3 (LE)

No. 54-12..............Interior Latex, Semi-Gloss, MPI Gloss Level 5 (LE)

D. Steel Structures Painting Council (SSPC):

SSPC SP 1-04 (R2004)....Solvent Cleaning

SSPC SP 2-04 (R2004)....Hand Tool Cleaning

SSPC SP 3-04 (R2004)....Power Tool Cleaning

1.5 WARRANTY/GUARANTEE

A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

B. All warranties and guarantees must be submitted before retainage will be released.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Interior Latex, MPI Gloss Level 3 (LE): MPI 52.

B. Interior Latex, Semi-Gloss, MPI Gloss Level 5 (LE): MPI 54.

2.2 PAINT PROPERTIES

A. Use ready-mixed (including colors), except two component epoxies, polyurethanes, polyesters, paints having metallic powders packaged separately and paints requiring specified additives.

B. Where no requirements are given in the referenced specifications for primers, use primers with pigment and vehicle, compatible with substrate and finish coats specified.

2.3 REGULATORY REQUIREMENTS/QUALITY ASSURANCE

A. Paint materials shall conform to the restrictions of the local Environmental and Toxic Control jurisdiction.

1. Volatile Organic Compounds (VOC): VOC content of paint materials shall not exceed 10g/l for interior latex paints/primers and 50g/l for exterior latex paints and primers.
2. Lead-Base Paint:
   a. Comply with Section 410 of the Lead-Based Paint Poisoning Prevention Act, as amended, and with implementing regulations promulgated by Secretary of Housing and Urban Development.
   b. Regulations concerning prohibition against use of lead-based paint in federal and federally assisted construction, or rehabilitation of residential structures are set forth in Subpart F, Title 24, Code of Federal Regulations, Department of Housing and Urban Development.
   c. For lead-paint removal, see Section 02 83 33.13, LEAD-BASED PAINT REMOVAL AND DISPOSAL.
3. Asbestos: Materials shall not contain asbestos.
4. Chromate, Cadmium, Mercury, and Silica: Materials shall not contain zinc-chromate, strontium-chromate, Cadmium, mercury or mercury compounds or free crystalline silica.
5. Human Carcinogens: Materials shall not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

A. Safety: Observe required safety regulations and manufacturer's warning and instructions for storage, handling and application of painting materials.

1. Take necessary precautions to protect personnel and property from hazards due to falls, injuries, toxic fumes, fire, explosion, or other harm.
2. Deposit soiled cleaning rags and waste materials in metal containers approved for that purpose. Dispose of such items off the site at end of each days work.

B. Atmospheric and Surface Conditions:
1. Do not apply coating when air or substrate conditions are:
   a. Less than 3 degrees C (5 degrees F) above dew point.
   b. Below 10 degrees C (50 degrees F) or over 35 degrees C (95 degrees F), unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.
2. Maintain interior temperatures until paint dries hard.
3. Do no exterior painting when it is windy and dusty.
4. Do not paint in direct sunlight or on surfaces that the sun will soon warm.
5. Apply only on clean, dry and frost free surfaces except as follows:
   a. Apply water thinned acrylic and cementitious paints to damp (not wet) surfaces where allowed by manufacturer's printed instructions.
   b. Dampened with a fine mist of water on hot dry days concrete and masonry surfaces to which water thinned acrylic and cementitious paints are applied to prevent excessive suction and to cool surface.

3.2 SURFACE PREPARATION

A. Method of surface preparation is optional, provided results of finish painting produce solid even color and texture specified with no overlays.

B. General:
1. Remove prefinished items not to be painted such as lighting fixtures, escutcheon plates, hardware, trim, and similar items for reinstallation after paint is dried.
2. Remove items for reinstallation and complete painting of such items and adjacent areas when item or adjacent surface is not accessible or finish is different.
3. See other sections of specifications for specified surface conditions and prime coat.
4. Clean surfaces for painting with materials and methods compatible with substrate and specified finish. Remove any residue remaining from cleaning agents used.

C. Ferrous Metals:
   1. Remove oil, grease, soil, drawing and cutting compounds, flux and other detrimental foreign matter in accordance with SSPC-SP 1 (Solvent Cleaning).
   2. Remove loose mill scale, rust, and paint, by hand or power tool cleaning, as defined in SSPC-SP 2 (Hand Tool Cleaning) and SSPC-SP 3 (Power Tool Cleaning). Exception: where high temperature aluminum paint is used, prepare surface in accordance with paint manufacturer's instructions.
   3. Fill dents, holes and similar voids and depressions in flat exposed surfaces of hollow steel doors and frames, and similar items specified to have semi-gloss finish with TT-F-322D (Filler, Two-Component Type, For Dents, Small Holes and Blow-Holes). Finish flush with adjacent surfaces.
      a. This includes flat head countersunk screws used for permanent anchors.
      b. Do not fill screws of item intended for removal such as glazing beads.
   4. Spot prime abraded and damaged areas in shop prime coat which expose bare metal with same type of paint used for prime coat. Feather edge of spot prime to produce smooth finish coat.
   5. Spot prime abraded and damaged areas which expose bare metal of factory finished items with paint as recommended by manufacturer of item.

D. Zinc-Coated (Galvanized) Metal, Surfaces Specified Painted:
   1. Clean surfaces to remove grease, oil and other deterrents to paint adhesion in accordance with SSPC-SP 1 (Solvent Cleaning).
   2. Spot coat abraded and damaged areas of zinc-coating which expose base metal on hot-dip zinc-coated items with MPI 18 (Organic Zinc Rich Coating). Prime or spot prime with MPI 134 (Waterborne Galvanized Primer) or MPI 135 (Non- Cementitious Galvanized Primer) depending on finish coat compatibility.

G. Gypsum Plaster and Gypsum Board:
   1. Remove efflorescence, loose and chalking plaster or finishing materials.
   2. Remove dust, dirt, and other deterrents to paint adhesion.
   3. Fill holes, cracks, and other depressions with CID-A-A-1272A [Plaster, Gypsum (Spackling Compound) finished flush with adjacent surface, with texture to match texture of adjacent surface. Patch holes over 25 mm (1-inch) in diameter as specified in Section for plaster or gypsum board.

3.3 PAINT PREPARATION

A. Thoroughly mix painting materials to ensure uniformity of color, complete dispersion of pigment and uniform composition.

B. Do not thin unless necessary for application and when finish paint is used for body and prime coats. Use materials and quantities for thinning as specified in manufacturer's printed instructions.

C. Remove paint skins, then strain paint through commercial paint strainer to remove lumps and other particles.

D. Mix two component and two part paint and those requiring additives in such a manner as to uniformly blend as specified in manufacturer's printed instructions unless specified otherwise.

E. For tinting required to produce exact shades specified, use color pigment recommended by the paint manufacturer.

3.4 APPLICATION

A. Start of surface preparation or painting will be construed as acceptance of the surface as satisfactory for the application of materials.

B. Unless otherwise specified, apply paint in three coats; prime, body, and finish. When two coats applied to prime coat are the same, first coat applied over primer is body coat and second coat is finish coat.

C. Apply each coat evenly and cover substrate completely.

D. Allow not less than 48 hours between application of succeeding coats, except as allowed by manufacturer's printed instructions, and approved by Contracting Officer's Technical Representative (COTR).

E. Finish surfaces to show solid even color, free from runs, lumps, brushmarks, laps, holidays, or other defects.

F. Apply by brush, roller or spray, except as otherwise specified.

G. Do not spray paint in existing occupied spaces unless approved by COTR, except in spaces sealed from existing occupied spaces.

1. Apply painting materials specifically required by manufacturer to be applied by spraying.
2. In areas, where paint is applied by spray, mask or enclose with polyethylene, or similar air tight material with edges and seams continuously sealed including items specified in WORK NOT PAINTED, motors, controls, telephone, and electrical equipment, fronts of sterilizes and other recessed equipment and similar prefinished items.

3.5 PRIME PAINTING

A. After surface preparation prime surfaces before application of body and finish coats, except as otherwise specified.

B. Spot prime and apply body coat to damaged and abraded painted surfaces before applying succeeding coats.

C. Additional field applied prime coats over shop or factory applied prime coats are not required except for exterior exposed steel apply an additional prime coat.

D. Metals except boilers, incinerator stacks, and engine exhaust pipes:
   1. Steel and iron: MPI 95 (Fast Drying Metal Primer).
   2. Zinc-coated steel and iron: MPI 134 (Waterborne Galvanized Primer).

E. Gypsum Board and Gypsum Plaster:
   1. Primer: MPI 50(Interior Latex Primer Sealer.

3.6 INTERIOR FINISHES

A. Metal Work:
   1. Apply to exposed surfaces.
   2. Ferrous Metal, Galvanized Metal, and Other Metals Scheduled (previously painted):
      a. 2 coats MPI 147 Interior Latex, Semi-Gloss, Institutional MPI Gloss Level 5.

B. Gypsum Board/Plaster:
   1. Two coats of MPI #145, Interior Latex, Institutional Low Odor/VOC (MPI Gloss Level 3).

3.7 REFINISHING EXISTING PAINTED SURFACES

A. Clean, patch and repair existing surfaces as specified under surface preparation.

B. Remove and reinstall items as specified under surface preparation.

C. Remove existing finishes or apply separation coats to prevent non compatible coatings from having contact.

D. Patched or Replaced Areas in Surfaces and Components: Apply spot prime and body coats as specified for new work to repaired areas or replaced components.

E. Except where scheduled for complete painting apply finish coat over plane surface to nearest break in plane, such as corner, reveal, or frame.

F. Refinish areas as specified for new work to match adjoining work unless specified or scheduled otherwise.

G. Sand or dull glossy surfaces prior to painting.

H. Sand existing coatings to a feather edge so that transition between new and existing finish will not show in finished work.

3.8 PAINT COLOR

A. Paint color to match existing adjacent surfaces as approved by COTR.

B. Coat Colors:
   1. Color of priming coat: Lighter than body coat.
   2. Color of body coat: Lighter than finish coat.

3. Color prime and body coats to not show through the finish coat and to mask surface imperfections or contrasts.

3.9 PROTECTION CLEAN UP, AND TOUCH-UP

A. Protect work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.

B. Upon completion, clean paint from hardware, glass and other surfaces and items not required to be painted of paint drops or smears.

C. Before final inspection, touch-up or refinished in a manner to produce solid even color and finish texture, free from defects in work which was damaged or discolored.

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SECTION 21 14 23
STORM DRAINAGE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Division Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes plumbing specialties for roof drainage systems.

B. Areas of Work:
   1. Roofs 3A, 3B and 3C

C. Scope of Work:
   1. Cut off all existing roof drain assembly flush with the top of the existing roof deck.
   2. Install specified drain inserts at all roof drains.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Submit product data including rated capacities of selected models and weights (shipping, installation, and operation). Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following plumbing specialty products:
   1. Roof Drain Insert

C. Maintenance data for inclusion in Operating and Maintenance manuals as specified in Division 1 Section "Closeout Procedures" for the following:
   1. Roof Drain Insert

1.4 QUALITY ASSURANCE

A. Comply with SAME B31.9, "Building Services Piping," for materials, products, and installation.

B. Electrical Component Standard: NFPA 70, "National Electrical Code."

C. Listing and Labeling: Provide equipment that is listed and labeled.
   1. The Terms "Listed" and "Labeled": As defined in the "National Electrical Code," Article 100.
   2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

D. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

1.5 WARRANTY/GUARANTEE

A. The Contractor shall furnish a written five- (5) year Guarantee covering labor and materials used in repairs against leaks and faulty workmanship or materials. All costs for any of the above shall be absorbed by the Contractor and material manufacturer.

B. All warranties and guarantees must be submitted before retainage will be released.

PART 2 - PRODUCTS

2.1 ROOF DRAIN INSERTS

A. General: Outlet should be match existing leader in diameter. All components are to be either aluminum or stainless steel.

B. Roof Drain Inserts:
1. Drain Flange: 18″x 18″ x. 080″ Aluminum – EIP coated
2. Strainer: 14″ diameter Aluminum
3. Stem: Male extension shall be 24″ or as far as possible if elbow is less than 24″ from the existing drain location at the roof deck.
4. Clamping Ring: .125″ aluminum
5. Seal: Backflow compression seal. The compression ring must be within 2″ from the end of the extension.

PART 3 - EXECUTION

3.0 ROOF DRAIN INSERT INSTALLATION

A. Cut off existing drain assembly level with roof deck surface. Clean, smooth and hone the interior of existing roof drain pipe to remove all dirt, burrs, and/or rust down to where the roof drain insert seal will contact the pipe wall.

B. Over the prepare drain bowl install a 16 gage HDG plate that extends a minimum 6 inches past the perimeter of the drain bowl or drain insert flange, whichever is greater. Cut a hole in the center of the plate to allow the drain insert body to set flush with the plate. Set the plate in water block and secure with stainless steel concrete screws once in every corner and 8″ on center between.

C. At the main roof drains extend the ¼″ separator board over the installed plate.

D. PRMA Roofs
1. At overflow locations, install wood sleepers under the flange of the drain insert. One layer of 2x lumber and 1 layer of 1/2" plywood secured 12" on center. Extend wood a minimum of 1/2" past the perimeter of the drain insert flange. All wood sleepers shall be completely sealed with the membrane/flashing. Install mechanical anchorage of membrane as required by the specification.
2. Install roof drain inserts at designated locations, in accordance with the drain insert and roof membrane manufacturers' installation instructions and under the observation of the drain insert manufacturer's technical representative. Note that a completely watertight seal must be created between drain insert and the drain pipe wall when the installation is complete.

E. Fully Adhered Roofs
1. Install wood sleepers under the flange of the drain insert to match thickness of insulation secured 12" on center. Extend wood a minimum of 1/2" past the perimeter of the drain insert flange. All wood sleepers shall be completely sealed with the vapor retarder.

2. Install specified cover board and membrane per the specification.
3. Install roof drain inserts at designated locations, in accordance with the drain insert and roof membrane manufacturers' installation instructions and under the observation of the drain insert manufacturer's technical representative. Note that a completely watertight seal must be created between drain insert and the drain pipe wall when the installation is complete.

E. Set the drain insert in a bed of water block and then secure the flange of the drain insert through the roof membrane and into the underlying sleepers with six evenly spaced stainless steel fasteners two inches in from the outside perimeter of the insert.

F. Install drain insert flashing collar or flange so that no water leakage can occur between the drain insert assembly and adjoining roofing. Maintain integrity of waterproof membranes, where penetrated.

3.2 COMMISSIONING

A. Preparation: Perform the following checks before start-up:
1. Systems tests are complete.
2. Damaged and defective specialties and accessories have been replaced or repaired.
3. There is clear space for servicing of specialties.

B. Before operating systems, perform these steps:
1. Remove and clean strainers.
2. Verify drainage is operational and piping is clear of obstructions. Flush with water until clear.

3.3 ADJUSTING

A. Adjust operation and correct deficiencies discovered during commissioning.

3.4 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

B. Place plugs in ends of uncompleted piping at end of day or when work stops.

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SECTION 22 00 00
MECHANICAL -- PLUMBING/DRAIN CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The roofing contractor shall refer to the General Requirements of the Specifications, General Conditions, Special Conditions, and Temporary Services that also pertain to work in this Section.

B. All local, city, state, or other codes required for work in this Section shall apply.

1.2 AREA OF WORK

A. All soil stacks and drains on Roof Areas
   1. Roofs 3A and 3B

1.3 SCOPE OF WORK

A. Drainage Component Cleaning: Provide adequate equipment and experienced manpower to mechanically clean all roof drainage components and soil stacks on each building. Each existing drainage component is to be checked and verified to be free, clear, and properly flowing. Drainage components are to be opened by Contractor upon arriving at site for the beginning of the project; open during the project, and open at the end of the project. This work is limited to the drainage components and soil stacks within all areas in the field of the new roofing to the cleanout in the basement of the building.

1.4 DRAWINGS

A. Roof drawings show the approximate location of the existing roof drainage components and soil stacks. It is the intent that all roof drainage components be cleaned. Any existing drainage component omitted from the drawings shall be considered as part of the work.

1.5 SUBMITTALS

A. The Contractor shall submit in writing a letter that all drainage components are operable at the beginning and the end of the project. If a letter is not submitted by the start of the project, all drains shall be assumed to be fully functional and any blockage will be the responsible of the Contractor to clear or repair.

1.6 Quality Assurance

A. The Cementitious Surfaced Foam Insulation Manufacturer will need to engage and pay for an independent Building Exterior Consultant, which has been in business continuously for at least 30 years and who has experience with observing EIP Composite PRMA roof installations within the past 36 months, to observe all of the prime contractor’s work for all technical specification scopes of work on a full time basis each and every day the contractors are on site.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 CLEANING OF DRAINAGE COMPONENTS

A. All existing roof drainage components and soil stacks are to be cleaned by means of a high-pressure wash and drainage components, which are still not draining to full capacity, shall be mechanically augured. Drainage components shall be cleaned prior to new roofing installation and new drainage component installations.

B. Drainage components shall be cleaned to the point of the lower clean out. The Contractor shall keep a roof plan for each area and verify that the drainage components have been cleaned with the COR.

C. The Contractor shall bring any drainage component with an unclearable blockage to the COR's attention and document procedures and time used in attempting to unblock the drainage component and estimate distance from top of the drainage component to the blockage.

D. Prior to the start of work, the Contractor shall submit a plan for accomplishing the work, including the method to be used for approval by the COR. The COR shall not be held responsible for any delay to the roofing Contractor as a result of additional plumbing work that may be required.

PART 4 - INTENT OF SPECIFICATION

4.1 INTENT OF SPECIFICATIONS

A. It is the intent of these Specifications that all drainage components be assured to be free and in operating condition prior to installation of new roofing. Contractors shall employ all reasonable methods to clean the drainage components and remove blockage short of any dismantling of interior plumbing. Any drainage component that cannot be unplugged by the plumbing Contractor shall be charted on the shop drawings and noted by the COR.

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